WOMEN'S BUREAU
U. S. Department of Labor
Washington

WOMEN IN THE LAW PROFESSION

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C O P Y

December 30, 1940

Mrs. Anna H. Settle, Attorney-at-Law,
Kentucky Home Life Building,
Louisville, Kentucky.

My dear Mrs. Settle,

I have your letter of December twentieth telling of your plan for registering the special skills of Altrusans in connection with the Defense Program, and requesting a copy of the form used by the Government for the registration of skills.

If you are referring to the project sponsored by the United States Civil Service Commission, under the supervision of Mr. James C. O'Brien and known as the National Roster of Scientific and Specialized Personnel, I suggest that you write directly to him, informing him of your project and asking if you could be sent a copy of the forms that are being used in that Government survey. I am told that there is a form for voluntary services as well as the one for scientifically trained people eligible for remunerative work, that the project is not being conducted as an employment service, but that as it is possible that some Altrusans may already be on that roster it would be well for you to Communicate with Mr. James C. O'Brien so that he could advise you as to the best procedure for your membership. As this division of the Civil Service Commission is operating in conjunction with the Advisory Commission of the National Council of Defense, possibly you may wish also to write to Mr. Sidney Hillman, the member of this Commission concerned with the question of available skills.

You may find it of interest to write to the two following Government agencies in Washington , asking for copies of forms which they have prepared:

U. S. Public Health Service, which has a form for registration of doctors and nurses.

National Resources Planning Board, which prepared and sent out to Government employees in certain professions, such as statisticians, cost accounting experts, and economics, very detailed forms for their registration.

I do not know whether copies of such forms would be available, but you might be able to secure sample copies through a direct request, if you should want them.

Under separate cover we are forwarding to you some additional material which we have prepared on women and the defense program.

Yours sincerely

Mary Anderson, Director.

Robinson's files

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

May 22, 1941.

Memorandum:
To: Miss Fanyerose Gancfried
From: Mary V. Robinson, Director, Division of Public Information, Women's Bureau, U. S. Department of Labor
Re: Women Lawyers in U. S. Government Service

It's difficult to give more than a very general idea of the opportunities for women attorneys in the Federal Service. So much, as you very well know, depends on the personal equation -- whether the person has influential friends, specialized experience, etc. -- that any "by and large" picture is likely to be of little value. And yet I would like to attempt some sort of a summing up which I have obtained from various sources.

Several years ago an analysis of women doing legal work for the Federal Government was made by Marion Harron,[1] member of the Board of Tax Appeals. At that time she placed at 324 the number of women attorneys. This figure was out of a total of 5,368 attorney positions in the Federal Service. Since then there has been some increase in the number.

The departments having the largest number of women attorneys were:

Veteran's Administration	137 women attorneys
Department of Justice	54
Treasury Department	21
Labor Board	19
Social Security Board	11
SEC	10
WPA	10

Perhaps you would be interested in the following analysis also given by Miss Harron of the duties of these attorneys, for the year 1937.

1/ Opportunities for Women Attorneys in Government Service. Marion J.Harron, p. 179-199. Opportunities in the Public Service. Institute of Women's Professional Relations, Research Headquarters, Connecticut College, New London, Conn. 1940.

Illustrations of Types of Work of Women Lawyers

At present there are six women who are regular Assistant United States Attorneys. In Washington in the Tax Division outstanding work is being done by Miss Helen Carloss who argues cases for the Government before the Circuit Courts of Appeal and the United States Supreme Court. Miss Stella Akin in the Court of Claims Division is also doing responsible and outstanding work. In general, the work of women attorneys consists of trial work before Federal courts, brief writing, research and the preparation of legal memoranda.

Treasury

There are 12 women in the office of the chief Counsel of Internal Revenue. Of these 12, there are two who try cases before the United States Board of Tax Appeals. The work of others consists mainly of analysis of cases in the Bureau of Internal Revenue and the handling of various Federal tax law questions.

Veteran's Administration

Most of the women attorneys are adjudicators, and reviewers who review claims for benefits payable under the veterans laws. There are six Junior Attorneys who take care of guardianship matters. There are five women in the Solicitor's Office, one of whom is Assistant Chief of Legal Service. There is one woman who is legal consultant to the Board of Veteran's Appeals and one of the members of the Board is a lawyer, Mrs. Lucy S.Howorth.

N.L.R.B.

The women attorneys employed by the Board in the Washington Office prepare briefs for appellate litigation before the Circuit Court of Appeals, review cases repsented to the Board by the Trial Examiners and draft opinions for the Board.

Status of These Women Lawyers

I am told that these women have not always had an easy time. While in the Federal Government there can be no actual salary discrimination there are other ways to place them at a disadvantage. A typical example of the difficulty of securing recognition in Government circles is furnished by the experience of a young friend of mine this year. She was hired as a Junior Attorney which is the lowest classification, but because of her unusual aptitude was singled out oby her section chief for loan to another Division for trial work. In this connection she went to various parts of the country arguing several cases before Federal courts. In each instance she was successful. In fact, her excellent preparation and cogent handling of arguments precipitated a great deal of favorable judicial comment. When her assignment was completed she was recommended for a promotion. It was not forthcoming, although men in the same division were given such recognition. When she inquired as to the reason for the distinction she was told, "Well you know that ** — — doesn't like women attorneys." Aware of the handicap she then attempted to transfer to another department. She discovered a position for which she was excellently qualified. But once more she ran headlong into the same old thing. The agency had never had a woman attorney in the position and hesitated to fly in the face of precedent.

Of course there is a brighter side to this picture. Some women attorneys have received recognition. I will just mention a few of them here in Washington, for you are much more familiar than I with the prominent members of your profession. In the State Department there is Anna A. O'Neill and Marjorie M. Whiteman who are Assistants to the Legal Advisor. Annabel Matthews in the Treasury Department is a Member of the U. S. Processing Tax Board of Review. The Justice Department frequently assigns Helen Carloss to argue certain cases before the United States Supreme Court. In this same agency is Louise Foster as Special Assistant

to the Attorney General.

No doubt you are wondering what is the practical effect of the new Civil Service executive order regarding attorneys. As far as I can find out it merely means a special merit system within the classified service. Registers which are unranked will be set up after examining and interviewing applicants that the Board of Legal Examiners shall recommend. The details of these procedures are as yet not worked out. I suggest that you write to the U. S. Service Commission for information on the situation and ask also to be notified of any opportunities or developments.

Following is a list (No.1) of the salaries of some of the highest paid women who are in legal work or in work where legal training would be essential and who are also in an executive position:

List No. 1

Names taken from Official Register of the United States, 1940. (Contains ~~only~~ names of persons occupying administrative and supervisory positions in the legislative, executive, and judicial branches of the Federal Government and of the District of Columbia, as of May 1, 1940);

State Department
Anna A. O'Neill, Assistant to the Legal Advisor.....$5,400
Marjorie M.Whiteman, Asst. to the Legal Advisor..... 4,800

Treasury Department
Annabel Matthews, Member, U. S. Processing Tax Board of Review..... 7,500

U. S. Board of Tax Appeals
Marion J. Harron..... 10,000

Federal Trade Commission
Ellen L. Love, Chief, Export Trade Section..... 4,000

Office of Special Counsel of the United States
Annette Abbott Adams, Assistant Special Counsel for the United States, San Marino, Calif..... 7,500

Veterans' Administration
Lucy S. Howorth, Associate member..... 5,800

Judicial - U. S. Circuit Court of Appeals
Florence E. Allen (Judge)..... 12,500

Judicial - U. S. Customs Court
Genevieve R. Cline (Judge)..... 10,000

Judicial - District Courts
7 clerks: 1, $6,500; 1, $5,800; 1, $5,600; 1, $5,200; 3, $4,600

D. C. Government - Juvenile Court
Fay L. Bentley (Judge).....$7,000

Municipal Court
Ellen K. Ready (Judge)..... 8,000
Blanche Neff, Clerk..... 3,600

LIST NO. 2

Names taken from American Women, 1940.

These are names of some other women who are attorneys in the United States Government, or D. C. Government, but their salaries are not given:

Nila Frances Allen, Lawyer
Lawyer, Assoc. with Income Tax Division, U. S. Bureau of Internal Revenue, since 1925.

Selma Munter Borchardt, Attorney
Mem. National Advisory Board, Nat'l Youth Adm.; Director of Washington Self-Help Exchange; Instructor, Washington College of Law

Mary-Agnes Brown, lawyer
Attorney, Office of the Solicitor, Veterans' Administration

Helen Rembert Carloss, Attorney,
U. S. Department of Justice

Louise Trimble Foster, Attorney,
Special Assistant to Attorney General, Department of Justice, Tax Division

Helen Elva Jamison, Attorney
U. S. Department of Justice

Mary O'Toole, Judge
Municipal Court

Esther Ruth Perling, Attorney,
Senior Attorney, P.W.A.

Elizabeth Freegans Reed, Attorney,
With Treasury Department, Washington, D. C., as examiner of various classes of fidelity and surety bonds

Alga M. Steig, Attorney, Government official
Chief, Over-the-Counter Section, Securities and Exchange Commission

Aline Frymire Stillwell, Attorney,
Office of General Counsel, Treasury Department, Bureau of Internal Revenue

Ellyne Elizabeth Strickland, Attorney,
Office of Chief Counsel, Bureau of Internal Revenue since 1937

Ruth Weyand, Attorney,
National Labor Relations Board since 1938

Marjorie M. Whiteman, Attorney,
Assistant Legal Adviser since 1930. Office of Legal Adviser, U. S. Department of State

OCCUPATIONS - LIBRARY

Magazine Division
Office of War Information
Social Security Building
Washington, D. C.

4/7/43

WOMEN IN LIBRARY WORK

Libraries are essential to the winning of the war and the peace. Librarians share responsibility with other educational and social agencies for building an informed public opinion on the important war and post-war issues which face the American people. They are maintaining informational and educational services important to the morale of adult citizens. They are meeting the varied needs of children and young people through libraries in educational institutions and public libraries. Librarians are rendering valuable service to war production through industrial plant libraries; and to war-related research and educational work in essential fields. Government agencies have developed and expanded their library service, and new agencies such as OPA have had to equip libraries for their own particular needs. These and other library services will continue to require larger numbers of professional librarians than are now available.

At the present time the shortage of trained librarians is estimated at 1,000 to 1,500. For the first time in more than ten years, the demand for librarians exceeds the supply. This condition is due to the over-all shortage of civilian personnel, the war-induced decrease in library school enrollment, induction of librarians into the Armed Forces, transfer of librarians into higher paid industrial jobs, and the unprecedented program of library service for the Armed Forces.

The shortage is most noticeable in the junior brackets among professional jobs, and in all types of clerical positions. High school or college graduates are badly needed to take care of clerical work--filing, correspondence, record-keeping, preparation of bookstock, typing of catalog cards, etc. Librarians just out of library school or with only a few years of experience are in demand for junior staff positions.

Librarians are needed most conspicuously to work with children in school and public libraries; and in cataloging departments, where books are classified and subject matter analysed for the public catalog. Hospital librarians are needed. Women with special technological or business background are wanted in research libraries. Government agencies can use librarians with training in economics, sociology or fields related to their specialty.

Recent emphasis on Pan-American intercultural relations has stimulated Latin American interests in American Library methods. Two public libraries under United States sponsorship have already opened in Latin America, one will open shortly, and others are

contemplated. North American librarians are being used for organization and cataloging of existing Latin American collections. There is a steady and unfilled demand for librarians with a speaking knowledge of Spanish.

Army and Navy library service is growing with the size of the Armed Forces and there is a constant call for librarians. These jobs are very attractive to women who want to devote themselves completely and tangibly to helping to win the war, without losing their civilian status. Application for Army library service should go to the Commanding General of the applicant's Service Command. Women who want to serve in Navy libraries must take the U. S. Civil Service examination for Junior Professional Assistant, which makes them eligible for Navy library service.

College graduates who want to prepare for library service should enroll for a one-year postgraduate course in library science. In some collegesthe senior year is devoted to this course, and students from other colleges may transfer at the end of their junior year. A list of accredited library schools may be secured from the Board of Education for Librarianship, American Library Association, 520 North Michigan Avenue, Chicago, Illinois. Short-term courses and summer courses have also been arranged in many colleges to help meet the emergency.

Librarians can secure jobs through many channels. Placement services are maintained by the American Library Association, the Special Libraries Association, 31 East Tenth Street, New York City, and by library schools. For the most part federal government positions are under federal civil service, and many public library systems are under local civil service regulations. Some state library agencies in state capitals help to place librarians. Personal application is the natural and obvious method, whenever the prospective employee has a particular library in mind. This is often the most effective method in the case of business and industrial libraries.

This material was compiled in connection with the program to promote full use of womanpower in necessary civilian jobs which is being sponsored by the Office of War Information and the War Manpower Commission with the cooperation of national magazines.

6/7/43

OCCUPATIONS

MEDICAL + DENTAL PROFESSIONS

Women Doctors Eager to Serve in War Zones

Two Professional Groups Act on Proposals to Meet Overseas Emergency

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By Anne Petersen

(In New York Times, April 27, 1941)

The eagerness of American medical women to contribute as generously in the present international situation as they did in the World War was deomonstrated forcefully in two steps taken last week.

In one instance they initiated their second attempt to obtain military status for women physicians and surgeons--a recommendation to which the New York County Medical Society gave its unanimous consent. The second was an offer made by the American Women's Hospitals of the American Medical Women's Association to include some of its members among the thousand doctors who will be sent to the war zone.

This week the house of delegates of the Medical Society of the State of New York convening in Buffalo, will take its stand on the recommendation for Army and Navy ranking for the women. A request for vigorous endorsement will be made by Dr. Emily Barringer, who is the only woman member of the house in the State society and holds a similar position in the house of delegates of the American Medical Association.

The offer of service abroad was made by the medical service committee of the women's medical association in a letter sent to the American Red Cross. It carries the signature of the committee chairman, Dr. Esther Pohl Lovejoy, who was the first American medical woman to wear a Red Cross uniform in volunteer service abroad during the last war.

500 Agree to Overseas Service

For the past year, Dr. Lovejoy has been compiling a registry of medical women, qualified and willing to serve in case of a national emergency--a task that was undertaken at the suggestion of the American Red Cross. More than 2,500 names appear on its cards to date, and of these approximately 500 have expressed their willingness to accept service overseas.

In her letter Dr. Lovejoy wrote: "In yesterday's New York Times we noticed the call from the British Red Cross for a thousand young doctors for service in different parts of the Empire, and we are hoping that some of the highly qualified women who have registered with us may be useful in this connection.

"You may recall that, during the last war, the American Women's Hospitals accredited a large number of women physicians for service with the American Red Cross and that their work was so satisfactory that just before the end of the war we had calls from the Red Cross to supply additional units.

"Since the article appeared, our telephone has been busy--registrants anxious to serve and asking if any women doctors will be sent in answer to the call from the British Red Cross. Any information or advice regarding this matter will be deeply appreciated."

The same emphasis on the World War service of American medical women appeared in the resolution which Dr. Barringer as president of the women's medical association of this city, introduced last week at the county medical meeting, and which becomes official business at Buffalo.

Status of Women Physicians

Although women physicians and surgeons demonstrated their fitness for wartime service during the World War when they financed units and staffed hospitals with well-trained officers in France and Serbia, she pointed out that the government has to date taken no cognizance of these professionals. It has, however, granted to women nurses Army rating with proper rank, pay and war-risk insurance.

A similar resolution was passed by the national women's group at its meeting a year ago. In the time that has elapsed, medical women believe, the situation has grown so critical that support for such a move among both medical and military men should be increasingly stronger. If the recommendation is forthcoming from the State body, it will be laid before the national association convening later this year, and will eventually require a change in military law.

One striking piece of evidence of the progress of women physicians and surgeons in this country will be dramatized at the convention of the women's group in Buffalo, when four women who have practiced for fifty years will be honored. Dr. Alice S. Woolley of Poughkeepsie will preside.

Rerun
LG:hj
4/26/43

to RN
from Mrs. Hansl
Please return
NH

RECRUITMENT OF WOMEN PHYSICIANS by the U. S. Public Health Service
Thomas Parran, M. D., Surgeon General, U. S. Public Health Service

For many years women physicians have been eligible for commissions in the U. S. Public Health Service. The first one was appointed in 1932. The Public Health Service is now actively recruiting women physicians for duty with the U. S. Coast Guard and for other war-time public health work.

Women physicians may be commissioned as officers of the reserve corps of the Public Health Service or employed under Civil Service.

The U. S. Coast Guard has requested the assignment of 15 women physicians for work with the SPARS. These physicians will be commissioned medical officers of the Public Health Service, not of the SPARS.

A woman physician has been assigned to the War Production Board to conduct an industrial health and medical service for employees of the Board. Another is an industrial physician in New Jersey. With the expected employment of some 20,000,000 women in industry during the next year, there is a definite place for women physicians in the field of industrial hygiene.

Three of the women medical officers are now clinicians in treatment centers for gonorrhea and syphilis. Like the men engaged in this work, they have been given a special course of training in the newer intensive methods of treating syphilis.

Other women physicians have been assigned to county health offices, to the Federal prisons for women, and to other fields of public health work. Several hospitals of the Public Health Service, including St. Elizabeths, are employing women psychiatrists.

The Public Health Service, with its widening scope and varied activities, is open to qualified women physicians, and offers many opportunities for immediate useful service in the war effort.

WOMEN DOCTORS DEMAND ROLE IN MILITARY SERVICE

Leading women physicians of Philadelphia and Pennsylvania today urged that the army and navy grant them recognition and "their rightful place" in the Nation's armed forces in this emergency.

Their demand for regonition was voiced after the Medical Society of the County of New York adopted a resolution declaring the 8000 women physicians and surgeons of the United States were "available" for services and urged that they be recognized.

Women here are attempting to obtain a similar resolution from the Phila. County Medical Society.

Eighteen months ago a committee of women physicians here wrote to the surgeon-general of the army and said they were ready to be commissioned for army service. He is said to have replied that "women are not needed and will not be needed."

Dr. Martha Tracy, assistant city Director of Health, said today:

"I'm sure all women physicians will hail the New York resolution as the opening wedge and that Pennsylvania will fall rapidly into line.

Dr. Catherine Macfarlane, winner of this year's Gimbel Award, said:

"Many army and navy positions could be filled adequately and well by women in army camps and base hospitals. They should not be asked to serve unless they are offered full commissions and rank equal to men."

Dr. Margaret Castex Sturgis, chairman of the Committee on National Defense of the Woman's Medical College, declared she "heartily indorses" the action of the New York organization.

"Women physicians should be given proper recognition in the armed forces of the Nation," she asserted.

Dr. Winifred B. Stewart said that "if women doctors go into the army they should have commissions."

From Ledger Phila. Pa.

April 23, 1941

ADVANCE RELEASE: FOR TUESDAY MORNING PAPERS, DECEMBER 9, 1941 M VR

Office of Defense Health and
Welfare Services

PM 1731

A general call for young women to enroll in schools of nursing to meet an existing shortage of professional nurses for the Army and Navy, and civilian requirements, was made today by Federal Security Administrator Paul V. McNutt, Director of Defense Health and Welfare Services.

Mr. McNutt declared that a critical need exists for thousands of professional nurses, and he urged young women to take advantage of the training courses now being financed by the Federal Government, not only to meet this shortage, but to prepare for careers in the distinguished profession of nursing.

"We have made every effort to obtain thousands of additional young women to take training in accredited schools for nursing this year," Mr. McNutt explained. "I urge that those who wish to volunteer contact their State or district nurses associations or the superintendent of nurses in their local hospital."

Mis Alma C. Haupt, executive sevretary of the subcommittee on nursing of the Health and Medical committee, said a call had been issued for 50,000 more student nurses for this school year to meet the present acute shortage of trained nurses. She pointed out that Congress had appropriated $1,250,000 for training nurses for defense.

These funds, she added, are being used to provide for basic student training, refresher courses for inactive nurses returning to active duty, and for post-graduate instructions in special fields.

In order to relive further the shortage of nurses, 100,000 volunteer nurses' aides are being trained by the Office of Civilian Defense and the American Red Cross.

Meanwhile, Mr. McNutt announced the appointment of Miss Sophie C. Nelson, director of the Nursing Service of the John Hancock Mutual Life Insurance Company, Boston, Massachusets, as chairman of the subcommittee of the Health and Medical Committee of the Office of Defense Health and Welfare Services. Miss Nelson succeeds Miss Mary Beard, who has resigned to devote full time to the nursing program of the American Red Cross.

Miss Nelson has had a wide and varied career in the field of nursing, both in the United States and abroad. She has served in administrative positions in nursing in St. Louis, Louisville, and Boston.

Following the last war, she held positions with the American Red Cross in its European relief program in Central Europe, the Balkans, and France. She was graduated from the Waltham Training School for Nurses, Waltham, Massachusetts.

The Subcommittee on Nursing was established to analyze the country's needs for professional and auxiliary nursing services in relation to national defense, and to make plans for meeting these needs. It is also charged with correlating defense nursing in the United States with the nursing services of Canada, Central and South America. In addition, it is serving as Nursing Advisory Council of the Office of Civilian Defense.

WOMEN'S BUREAU
MAR 0 1942

JOINT MEETING

of the

NATIONAL CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS

and the

SUBCOMMITTEE ON INDUSTRIAL HEALTH AND MEDICINE
of the Health and Medical Committee, Office
of Defense Health and Welfare Services

April 9, 10, and 11, 1942

Social Security Building Auditorium
4th and Independence Avenue, S. W.
Washington, D. C.

THURSDAY, APRIL 9, 9:00 a.m.

9:00 a.m.: Registration. Lobby of the Auditorium.

9:30 a.m.: Opening session. Dr. C. A. Nau, Chairman of the National Conference of Governmental Industrial Hygienists, presiding.

1. Remarks by Surgeon General Thomas Parran, U. S. Public Health Service.

2. Greetings to the Conference. Paul V. McNutt, Administrator, Federal Security Agency.

3. Manpower and Training. Channing R. Dooley, Chief, Training in Industry Section, Labor Division, War Production Board.

4. The Work of the Subcommittee on Industrial Health and Medicine. Clarence D. Selby, M. D., Chairman.

5. Activities of the Committee for the Conservation of Manpower in War Industries. Verne A. Zimmer, Director, Division of Labor Standards, U. S. Department of Labor.

   Discussion: Michael M. Davis, Chairman of the Committee on Research in Medical Economics.

6. Wartime Tasks of the States' Relations Division. Assistant Surgeon General Joseph W. Mountin, U. S. Public Health Service.

THURSDAY, APRIL 9, 12:30 p.m.

Executive Session: Dr. C. A. Nau, presiding.

1. Roll call.
2. Committee appointments.
3. Report of Executive Committee.
4. Report of Secretary-Treasurer.

THURSDAY, APRIL 9, 2:00 p.m.

1. The Cost of Absenteeism and Suggestions for Lessening the Loss. Andrew Fletcher, Vice-President and Treasurer, St. Joseph Lead Company.

2. Labor and the Industrial Health Problem. Ralph D. Hetzel, Jr., Director, Economic Division, Congress of Industrial Organizations.

3. Coordination of Industrial Health Effort. Orlen J. Johnson, M. D., Council on Industrial Health, American Medical Association.

4. The Relationship of the Hygienist to Medicine in Public Service. Raymond Hussey, M. D., Medical Board for Occupational Diseases, Maryland State Industrial Accident Commission.

FRIDAY, APRIL 10, 9:30 a.m.

Dr. Clarence D. Selby, presiding.

1. Wartime Field Activities of the Division of Industrial Hygiene. Sanitary Engineer J. J. Bloomfield, U. S. Public Health Service.

2. California's Industrial Hygiene Program in War Industries. H. T. Castberg, M. D., Acting Chief, Industrial Hygiene Service, California Department of Public Health.

3. The Industrial Hygiene Program of the Connecticut State Medical Society. Clifford Kuh, M. D., Chairman, Committee on Industrial Health.

4. Recent Industrial Hygiene Activities in Ontario, Canada. J. G. Cunningham, M. D., Director, Division of Industrial Hygiene, Ontario Department of Health.

5. Tuberculosis Control in Defense Industries. Passed Assistant Surgeon H. E. Hilleboe, U. S. Public Health Service.

FRIDAY, APRIL 10, 2:00 p.m.

1. Wartime Research in the Division of Industrial Hygiene. Surgeon Paul A. Neal, U. S. Public Health Service.

2. Dermatoses in the War Industries. Medical Director Louis Schwartz and Passed Assistant Surgeon John E. Dunn, U. S. Public Health Service.

3. Industrial Nursing in the United States. Olive M. Whitlock, Public Health Nursing Consultant, U. S. Public Health Service.

4. Health Information for War Workers. Elizabeth G. Pritchard, Division of Sanitary Reports and Statistics, U. S. Public Health Service.

5. Summary of the Conference and Future Objectives. Medical Director James G. Townsend, Chief, Division of Industrial Hygiene, National Institute of Health.

FRIDAY, APRIL 10, 4:30 p.m.

Executive Session

FRIDAY, APRIL 10, 6:30 p.m.

Banquet

Cosmos Club
Madison Place and H Street, N. W.
Washington, D. C.

SATURDAY, APRIL 11, 9:30 a.m.

Informal visit of delegates to the laboratories of the Division of Industrial Hygiene, National Institute of Health, Bethesda, Maryland.

SATURDAY, APRIL 11, 10:00 a.m.

Round table will be held for the public health nursing consultants of State divisions of industrial hygiene. Other members attending the Conference are invited. (Room 107, Division of Industrial Hygiene, Building No. 2, National Institute of Health, Bethesda, Maryland.)

OCCUPATIONS

METAL: TRADE

X a few Outstanding Women Engineers

~~ENGINEERING AND ALLIED PROFESSIONAL WORK~~

(Probably in Who's Who)

Mrs. Mabel McFerran Rockwell, Production Engineer, Lockheed Aircraft Plant 408 S. Spring St., Los Angeles, California.

Miss Mary Elizabeth Miller, Engineer, Glenn L. Martin, Baltimore, Maryland.

Margaret Ingels, Carrier Corp., Syracuse, N.Y. (air conditioning) (First woman in U.S. to get mechanical engineering degree, Univ. of Ky.)

Mrs. Ruth Wallgren, Westinghouse Elec. & Mfg. Co. (drafting of finished designs of turbines) (Enterprise-Beaumont, Texas, 1/21/42)
She also draws gun carriages, howitzers and dreadnaughts.

Miss Olive M. Dennis, Baltimore, Md., Engineer of Service B & O R.R. (Only woman engineer employed by a railroad to ride its lines and suggest changes in equipment and service designed to make passengers more comfortable.)

Catherine Ferguson tests sample bars of New Alloys for General Electric, Schenectady, N.Y. (One of her testing machines is the flywheel into which the alloy bar is fitted, rotated at 2400 r.p.m. and then struck with a hammer to test its resistance and strength.) (Graduated from Northwestern University. Studies engineering and metallurgy at night school to fit her for this job.)

Emily T. Hannan, Head of Turbine Calculations Dept., General Electric, Schenectady, New York.

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(Times, N.Y.C. 12-5-41)

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OCCUPATIONS

METAL TRADES - 1940-1941

WOMEN'S B...
U.S. Department of Labor
Washington, D. C.

Extracts from

Letter of Feb. 29, 1940, from Olive Dennis, Engineer of Service, Baltimore and Ohio Railroad Co.

as to Opportunities for Women in Engineering

..... I have been asked to give you what information I could as a result of my being a woman graduate in civil engineering and somewhat experienced in the difficulties confronting any young woman undertaking a career along this line.

The field of engineering is still a pioneer one for women, and each individual has to carve out her own niche by discovering some aspect of the business she wishes to enter which is peculiarly suited to a woman's talents, in other words, she must have some contribution to offer based on the fact that she has a woman's talents, viewpoint and experience. If she tries to compete with men graduates in engineering on a comparable basis, I feel that she will be ignored in favor of the other sex, unless she happens to have some personal contact, or, to put it bluntly, "pull".

Most large corporations like Du Pont prefer men applicants because they feel they are more suited to advancement in any department of the company. There are only a limited number of engineering positions that women can fill easily due to the limitations of physical strength and social requirements.

It is important from the outset to have in mind a definite kind of work which affords opportunity for the excise of the special talents more or less peculiar to women. Two of these talents, in my opinion, are patience and accurate attention to detail. Women can make excellent draftsmen, map makers and steel detailers. My first experience was gained as a draftsman in the Bridge Engineering Department of the Baltimore & Ohio Railroad. However, such work has definite limitations for a woman as the opportunities for advancement must be made to positions as inspector or head of actual construction work, positions not even considered for a woman.

Unless a woman has a family connection in an engineering firm, or enough capital to go into business herself, her chances of rising to an executive position in structural engineering seem negative.

There are lines of research conducted by manufacturers in testing strength of clothing materials, suitability of implements for household use, packaging and styling of different products, etc., and in many of these studies women have done important work.

I shall list a few positions held by women engineers with whom I am personally acquainted, but many of these were created only after long and almost heartbreaking effort. Two women civil engineering graduates of Cornell have gone into contracting and building, one with her own business after years of experience in a drafting room of the American Bridge Co., the other as a writer of specifications and cost estimates for the New York World's Fair Authority. The latter position was temporary, and in this case the woman was a member of a family in the contracting business.

Sent to Mathematics

December 16, 1941

My dear Miss

We have your letter of December 4th, regarding women's opportunities in engineering. While I do not feel we are qualified to advise you in this field - as our investigations and surveys are concerned mostly with women workers who are wage-earners - there are one or two general observations we can make.

There are few women nationally known in the engineering field at present - i.e., it is unusual to hear about women engineers. In the biographical dictionary "American Women 1939-1940", there are but 10 women engineers. I am enclosing extracts from a letter written by one of these, addressed to the father of a young woman college student, who was writing us as you have, and we sent on his request to Miss Dennis. I believe you will find these personal comments of great interest.

Recent information along this line is the following: A woman is production engineer for the Lockheed aircraft plant in California; another woman is an engineering official with a refrigerator company. A woman electrical engineer has been appointed to the staff of the Massachusetts Institute of Technology; another is a mining engineer (whether actively practicing, we don't know).

The Civil Service Commission announces a definite scarcity in the Government Service of engineers in most of the branches - civil, mechanical, aeronautical, marine, chemical, electrical - and examinations also remain open for engineering draftsman, "junior" engineer, and engineering aide. The U. S. Employment Service, in its latest report on labor market development, reports a shortage of aeronautical and mechanical engineers in various parts of the country (covering private industry).

From the above, it would seem that women of exceptional ability with an engineering degree from a college of recognized standing in the engineering fields have an excellent opportunity in these next few years. As in all the so-called men's professions, however, a woman has to be a great deal better than the average man to receive recognition.

To obtain the best suggestion for your student as to which branch of engineering she should enter, I think advice from the deans of the outstanding engineering schools should be obtained. If she could consult Dean Melvin L. Enger (in a personal interview) of the College of Engineering and Director of Experimental Engineering at the University of Illinois, I am sure valuable guidance help would be forthcoming, based on an evaluation of her scholarship and aptitudes.

See RSN for other data on this program

You may be interested in writing Dr. Fred J. Kelly, in charge of the engineering program for defense vocational training under the U. S. Office of Education (address, Washington, D.C.). Ohio State University is one of the institutions, under his program, that has accepted young women in its engineering school for an intensive course (at the most, no longer than 6 months) in applied engineering to meet the demand for certain types of semi-professional and supervisory employees in defense factories. I do not know that this offers particular interest to your student, but you may find the information useful in other ways.

Sincerely yours,

Mary Anderson, Director

rfn
ec

OCCUPATIONS

METAL TRADES + 1942

Women in Foundry Work Aided by New Machine

CLEVELAND — Women are going to work in the foundry—one of the more recent masculine strongholds to give way to them.

An improved moulding machine which adapts foundry work to feminine sensibility and strength makes this possible.

The new machine was designed for the aviation industry, which employs large numbers of women, by the Osborn Manufacturing Co., a pioneer in moulding machine development. It is fitted to turn out a new type of cylinder head for airplane engines.

The new machines do not require a 75-pound pull as the old ones did. All the little woman has to do is open an air valve and give the rollover table a slight manual start, which has been retained as a safety factor.

The new type cylinder head required a large number of closely spaced fins to give greater cooling surface and increase performance and efficiency. Moulds for this type cannot sustain shock during the rollover operation because the slightest disruption damages the delicate sand sections between the fins and results in a scrap casting.

To control this situation, Osborn has built a power rollover mechanism around a double acting hydraulic piston which uses air on oil as a source of power and provides an oil cushion at both ends of the stroke. The mould rolls over with a smooth, positive motion that can be directed quickly and easily without fatigue.

WALL ST. JOURNAL
NEW YORK CITY
DECEMBER 26 - 1942

Christian Science Monitor
Oct. 12, 1942.

U.S. 'RUHR' IS INVADED BY WOMEN

Youngstown, Ohio -- Even the giant steel plants in this "Ruhr of America," long considered the exclusive territories of male workers, have just been invaded by hundreds of women workers to relieve the acute shortage of manpower. . . . . .

Youngstown Sheet & Tube Company, and Republic Steel Corporation already have employed hundreds of women for lighter jobs, and are planning to expand the program greatly as soon as necessary facilities can be provided. Carnegie-Illinois Steel Corporation also is planning to use women workers, while some of the large steel fabricating plants in the area already have hired hundreds of women and are planning to take on many more.

While use of women in the steel mills is greatly handicapped by rigid state laws on employment of female workers, steel executives here feel they fit in nicely on such positions as clerical work which goes on around the clock, timekeeping, billing and shipping, crane operating, time and motion studies, inspecting materials, and even laboratory work.

Women Welders

Many women already have been employed here as welders.

Both the public school system and Youngstown College are eagerly seeking men of over 45 and women to study various subjects to fit them for industrial jobs.

The shortage of labor, both skilled and unskilled, in the district steel mills has become so acute that a check here recently showed unfilled jobs for 1,000 unskilled workers at the steel plants alone. The other plants also had large shortages.
. . . . . .
The armed services have taken an estimated 6,000 to 7,000 men from the steel plants near here, one plant losing 1,400 of its 10,000 men; another losing 1,250 of its 8,500 men. One mill reported it has 1,200 fewer employees than a year ago, another reported about 900 less, although the demand for steel is greater than ever.
. . . . . .

Christian Science Monitor-November 10, 1942.

YOUNGSTOWN, Ohio, Nov. 10 - Twenty-three women, including a grandmother, have been hired to meet a man-shortage problem in the hoop shop of the Carnegie-Illinois Steel Corporation here, the United States Steel subsidiary reported today.

The first group of women hired by the Corporation is processing strip, which consists of cutting large coils of steel, stacking and transporting the material on an electric ram truck. Even the truck operator is a woman.

~~Phillips~~
Myrander

KAISER COMPANY, INC.
Portland, Oregon
September 16, 1942

Miss Mary Anderson, Director
U. S. Department of Labor
Women's Bureau
Washington

Dear Miss Anderson:

Your letter of August 31, 1942, to Mr. Henry J. Kaiser has been referred to me.

The newspaper article to which you referred was substantially correct with regards to the percentage of jobs that can be done by women. We feel that they are particularly adaptable to the following; welding, tacking, warehouse work, general labor, and electrical shop helpers.

Careful selection and follow-up on the job is important, and we have a program outlined which brings each woman on the job with an interview at which time our safety program is explained as well as rules of conduct on the job. We have found that a careful selection of women workers is very important, and a careful follow-up and interview on the job is necessary inasmuch as most of them are being put in with working class of men that is a new experience to them.

We have some photographs available and will send some to you as soon as prints can be made.

If you have any questions to ask on any particular phase of our program, please feel free to write us again.

Yours very truly,
KAISER COMPANY, INC.
Portland Yard

J. C. Murray
Personnel Manager

PORTLAND YARD

Examiner
San Francisco, Calif.
Dec. 30, 1942.

ON THE FIGHTING FRONTS AT HOME
by Jean Nowell

While her brother serves as a private with the Army Medical Corps, Nell Loscutoff, 19, sands down desks, flag lockers and life preserver racks for Liberty ships at Mangrum. Holbrook & Ellis' plant No. 2 at 20 Eleventh St.

A finisher's helper now, she was an elevator operator before the war. Working with her are Verta Frank, 21, finisher, and Edith Storm, 18, finisher's helper.

Miss Frank formerly worked as an egg breaker, the eggs being dried for use in powdered form by the Army and Navy. A brother, Corp. Beverly Pool, is in North Africa.

Miss Storm held jobs in a laundry and an envelope manufacturing concern before turning to war work.

* * *

In the plate shop at Richmond Shipyard No. 3, they call her "Tiny" but her name is Betty M. Cook. Betty is 19, just under 5 feet, and with heavy safety shoes, hard hat and her hands full of equipment she weighs just ninety pounds plus.

She's an expert operator of a type of burning machine used for cutting circles and long sweeping curves in thich sheets of steel. Her work is so exact that she is moved throughout the plate shop, wherever there are intricate lines to be burned.

U. S. Department of Labor
WOMEN'S BUREAU
Washington

PRELIMINARY STATEMENT ON WOMEN IN STEEL MILLS

Calumet Steel Producing Area---Gary and South Chicago December 30, 1942

Extent to which women are employed in the steel mills:

Women are just beginning to come into the steel mills, and the proportion is as yet very small. The South Chicago works of Carnegie-Illinois Steel, with about 19,000 industrial employees, has taken on about 700 women during the past six weeks. Approximately one-half of these are factory clerks--checkers, recorders, and general clerical workers within the mill. This does not include the women in general administrative offices. In Gary Works of Carnegie-Illinois, the largest unit of the company, from 250 to 300 women are employed in the mill.

In office work in the Gary Mills of Carnegie-Illinois, 90 percent of all the office jobs were formerly filled by men; at present women do about 50 % of them. The greatest substitution of women for men so far has been in the factory offices.

In Tubular Alloy Steel at Gary (a new plant) the force may eventually be 50 to 60 percent women. (This includes fabrication work, using relatively light-weight material to make small parts, and is therefore lighter work than in many of the other steel mills.) At the Armor Plate Mill (Carnegie-Illinois) Mr. Jenks, general superintendant, has estimated that 20 percent of the work may be done by women.

In South Chicago plants other than Carnegie-Illinois, Republic Steel and Youngstown have a few women; Wisconsin Steel Works and Interlake have none.

Present Jobs of Women in Steel Mills in Calumet Area:

These in maintenance shops only:

- Laborers - cleaners, sweepers, slag shovelers -(in(blacksmith shop, (foundry, (blast furnace, (stock house
- Welders - (repair work)
- Machine operators - lathes, gear cutters, drills, etc.
- Electrical - taping, winding coils, soldering, etc.

Core-makers
Crane operators
Inspectors (a few in one mill)
Chemists (laboratory aides)
Factory clerks

Additional jobs for women suggested by C I O interviewees:

80 per cent of oilers' jobs
50 per cent of all crane operators
Hot-bed operators (operating controls)
Filing machine operators

Seniority:

Many of the beginning jobs, according to the union, are heavy labor and men have progressed to lighter jobs. Women cannot take over many of the heavy jobs which have preceded the ones they do. E.g., a woman can be a crane operator, but not a hooker-man on the floor; mormally a crane operator begins as a hooker-man.

The heavy, dirty, and dangerous nature of much of the work will act as a barrier to the extended employment of women in the steel mills. It is doubtful whether women would ever be employed around the Bessemer and Open Hearth Furnaces.

Selection of women:

USES stressed the need of careful selection of women for steel. Size and physical characteristics are important.

Colorado Fuel & Iron Co. Minnegua Steel Works - Pueblo, Colorado June 1, 1943

Defense Product:

Steel - rails - wire spikes - nails and general jobbing manufacture of steel products and 155 mm steel shell forgings.

General:

No women were employed inside of the plant yard until about a year ago when a few women were put into the plant offices on regular clerical work connected with production. Have about 100 women in the plant offices and a little less than 200 in the shops. The labor market for men is not depleted in Pueblo but a better caliber of women as far as employability are available. The industrial relations department is considering the possibility of employing women whenever vacancies occur. A campaign is underway to condition the foremen and group leaders to the idea of "more women." See Exhibit I, a pamphlet of "Women in Industry" which was being sent to all supervisors throughout the shop.

Management does not anticipate that any large proportion of the industrial workers in the mills can be women but it was estimated that two or three times as many women as are now employed can be used effectively and also more in the plant offices to replace draftees and other vacancies. The possible jobs for women which were commented on were: further employment of women on all the work they are now doing as some men are employed on the same type of work; laboratory aides and technicians; guards; crane operators; tool crib and storeroom attendants; number carriers and number board recorders; tenders of small furnaces in bolt and spike mill; watching equipment, pumps and controls in the coke and benzol plant; hookers, tending air and gas controls for the soaking pits in rail mill, tending levers which stop and cut molten rails on conveyors; sand blasters, hookers, and general helpers in the shell forging plants, etc.

Present jobs of women:

155 mm shell forgings - Women were trained as operators of the lathes which automatically machine the outside of the projectile and also on the centering machine which marks the exact center at the top as a beginning spot

for further machine operations. Because of men's greater seniority only a few women have been used on the lathes or the centering machine. The shell forgings weigh about 120 pounds each and move on conveyors. Women are punching the shells along on roller conveyor lines, inspect and check overall length and concentricity, hook shells on to forked floor or "walking" cranes to move them to conveyors or machines, weigh forgings - girl is doing a clerical type of weight recording work - and mark shells with hammer and die. At time of visit only one shell line and about 25 women were employed but another line was to be put back into production and expect to use at least 30 or more women and more on this line will be machine operators. Women who have seniority will be promoted to lathes and centering machines. Work of forging, scaling, tending draw press benches piercing press and hooking hot shells from the draw presses is all heavy and hot and did not seem possible for most women. Do not anticipate putting women on these. Tried women on the hooking of hot shells but took them off. May try it again if necessary. May use women on automatic sand blasting.

Wire Mill -- Women are employed on the finishing of nails, on the making of kegs -- tops, packing of nails and weighing, and make spools for wire coiling. About 60 women are employed. Women (and men) tend large rumble barrels where nails are cleaned before packing. Loading of the rumbles and handling the heavy doors to the barrels is done by men. Women unload with rakes and fill kegs with 100 pounds of nails. They roll the keg to the scale and add or remove nails to bring weight to 106 1/2 pounds -- nails 100 pounds, keg 6 1/2 pounds. Work is dirty and heavy.

In the keg making sections, men are coopers assembling the shook and put the metal hoops on. Women -- a few are employed on wiring some of kegs. They use a wire pulling or strapping tool. Women were making the tops for kegs joining and fitting parts for the top together in jigs and using a sanding wheel to finish parts for exact fitting and joining. Women in both the nail and spike shop were nailing tops on to kegs and were standing on kegs bending double to nail by hand. One girl feeds the keg chute to the packing room. Tried replacing a boy with a girl on conveyor line where kegs come from cooper shop. More kegs are made at times than can continue on to packing floor so must do stacking. Girl could not keep up. Would take two to replace boy so taken off.

Bolt mill -- Formerly much of the work done in the bolt mill was considered boys work and women have been substituted for the boys. Sixty to 70 women employed. As inspectors women were visually inspecting bolts and nuts on conveyors and also in boxes and bins where they were moved from one container to another. Girls sat on boxes, kegs, stools anything available. Grinding balls -- used in machines such as cement and concrete mixers -- were being inspected by women. Women were tapping nuts on special multiple spindle (drill) presses. Work was dirty and greasy but no special strain. Some women were operating threading machines on large bolts. Women were grinding the sides of the bolt heads and some very tapering and finishing the ends in special machines. Some were general helpers doing hand trucking, spreading sawdust around on oil puddles and nailing the tops on kegs. Women filled kegs with bolts and railroad spikes. The bolts and spikes are heavy and girls were using rakes in shoving the bolts into the kegs and also packing the last amounts in by hand to get the correct weight -- 100 pounds to a keg. Wore gloves -- provide own. Work seemed heavy and girls were a husky type.

Electric Shop -- Maintenance work. Five or six women are making new coils, spreading wire, looping, putting cells on, winding small coils, dipping them in varnish and paint and drying in ovens. Work was at one side of shop and was light and clean. Women receiving 80 cents an hours. All tearing down, repairing and reassembly of large armatures was being done by men. More women could be employed but work on large armatures is fairly heavy and requires all around skill because it is of a maintenance not production nature.

12 inch mill -- Small steel parts are manufactured on a job shop basis. No women could be found at work at time of visit -- off the job temporarily, but were reported as a few women on grinding, watching conveyors and doing miscellaneous light jobs. More jobs could be assigned women here tending controls and as helpers.

Rail mill -- Rails for the railroad are manufactured. At present women are employed as attendants in scale house and as checkers of hot billets. Boy was being employed on recording numbers and production data at a mark-up board on the production line. This could be a woman. Also, escort pointed out a sitting job where boy was operating -- pulling levers -- which stopped and cutting the molten billets into rail lengths. Work is hot because of exposure to the red hot billets which are passing on a conveyor but not strenuous.

Warehouse -- A few women employed as checkers in warehouses.

Scarfing -- Women -- three or four -- are employed along with men as scarfers. Scarfing takes the place of hand chipping in cleaning, and also remedies defects. The scarfer uses a welding torch to remove irregularities, defects, cracks, and lap wells on steel billets. Women trained on the job in a few weeks. Women only employed on the lighter billets as they must be turned over and even with mechanical aids the turning may be heavy. Expect to have more women scarfers. Women wear welders goggles and protective aprons.

Feb. 1942

SOURCE

MANNING TABLE

Filed at W. M. C.
18th & Pennsylvania Avenue,
Mrs. Dougherty, Librarian.

Firm - General Electric Company — Oakland, California.

Product — Mazda Lamps

Employment	Total	127	
	Women	88	White
	" "	10	Negro

Women's jobs other than clerical and administrative.

Occupation	Dictionary Code No.
1. Stem maker	7-00,023
2. Sealing M. O.	700,0025
3. Baser I	700,0 13
4. Base-filling M. O. 5. stem mounting machine	7-00,012
6. Finisher } 1 job	9,00.91
K. Packer II }	
7. Box Sealer	9,00.91
8. Flare maker	6-65,452

Occupations not listed in Occupational Dictionary.

9. Quality checker:

Reads vacuum lines to machines, reads barometric pressure.
Makes meter glow test on sealed lamp.
Checks gas pressure in lamp.
Makes visual inspection of mount and stem.
Determines filament turns per inch on special gage.
Checks temperature of fires on sealing machine.
Tests strength of lamp base in torsion tester.

10. Group Server:

Supplies materials
bulbs, mounts and
keeps unit clean.

11. General Floor Work:

Repairs poorly soldered lamps, remelts solder and applies solder.
Repairs burned off lead wires.
Removes crooked bases.
Inspects repaired lamps and packs.

Filed at W. M. C.
18th & Pennsylvania Avenue,
Mrs. Dougherty, Librarian.

Firm - General Electric Company Oakland, California.

Product Mazda Lamps

Occupations not listed in Occupational Dictionary.

12. Breakage girl:

Collects broken parts, inspects them, sorts, and responsible for salvage.

13. Mazda Service Inspector:

Final inspection of lamps after ready for shipment.
Samples stock.
Makes visual inspection, lights lamp, gages for length etc.

14. Relief Operator:

Substitutes for stem makers, sealers, basers and finish packers. Must be skilled in all operations.

(Occupations 1 thru 5 sometimes included in general term "assembler")

Filed at W. M. C.
18th & Pennsylvania Avenue
Mrs. Dougherty, Librarian

Firm - Westinghouse Company Emeryville, California

Product - Mfg. & repair of electric motors, generators, gear motors, transformers, steam turbines.

Occupations in the plant regarded as suitable for women were designated as "S", inference being they were not yet so employed.

Occupations regarding as "suitable" for women.

I. Sheet Metal Shop:

1. Sheet metal layout
2. Sheet metal worker

II. Weld Shop:

1. Welder, arc
2. Flame Cutter Operator

III. Machine Shop:

1. Machinist II
2. Machinist bench
3. Boring mill operator
4. Cylindrical grinder operator
5. Engine lathe operator
6. Milling Machine Operator
7. Radial drill operator
8. S. S. Drill operator
9. Machine helper
10. Machine apprentice
11. Stock boy

IV. Motor Assembly Department.

1. Floor assembler
(not "motor assembler "A" or "B")

V. Transformer Assembly:

1. Assembler fitter A
2. Die cutter (1)
3. Bushing & lead assembly
4. Assembler fitter B
5. " cores C
6. Bushing & Lead assembly B
7. Assembler - fitter C

Filed at W. M. C.
18th & Pennsylvania Avenue
Mrs. Dougherty, Librarian

Firm - Westinghouse Company Emeryville, California.

Product - Mfg. & repair of electric motors, generators, gear motors, transformers, steam turbines.

VI. Carpenter Shop:

1. Crater III
2. Laborer process (wood box) (8-39-14)
3. Transformer (wood details)

VII. Inspection & Test Department:

(Testers suitable but require)
(1, 2 and 4 years engineering)

1. Inspectors

VIII. Maintenance:

1. Maintenance Mechanic's helper
2. Porter
3. Saw filer machine

IX. Switchboard Assembly:

1. Electrician 4-97.010 (#9 & #47 & #93)
2. Electrician adjuster 5-00.933 (#22)
(Wireman & Assembler Control)
3. Spray paint

X. Electric Steam Turbine Repair:

1. Electric Motor Analyst 5-83-431
2. Machinist II
3. Electric instrument repairman (meter repair)
4. Armature winder, helper repairs (winds & repairs)
5. Electric motor repairman (assemble repair)
6. Meter repair
7. Coil winder II
8. Laborer - electric motor repair (9-83.43) (clean & tape coils)

Filed at W. M. C.
18th & Pennsylvania Avenue
Mrs. Dougherty, Librarian

Firm - Westinghouse Company Emeryville, California.

Product - Mfg. & repair of electric motors, generators, gear motors, transformers, steam turbines.

XI. Commercial Domestic Refrigeration Rebuilding:

1. Refrigeration inspection
   (Performance and noise test)
2. Electric refrigeration serviceman.
   ~~(Serviceman~~)
   (Pump assembler & tester)
   (Pump out heads & ~~drill~~) pulls
   (Weld heads)
   (First assembly)
   (Assembly control & calibrate)
3. Strip refrigeration units
   Laborer (electric motor repair)

XII. Motor Winding:

1. Armature wind II
   (stator)
2. Internal grinder operator
   (stator grinder)
3. Coil shaper
   (Pull & form motor coils)
4. Armature wind I
   (Wind open slot motors)
5. Coil wind II
   (automatic)
6. Stator winder "C" & "D"
7. Coil tape machine
   (Tape & insulate open slot coils)

XIII. Transformer Winding:

1. Coil assembler "B"
2. Coil winder

The table also indicates the possible use of women as apprentices in some lines, also in some jobs in the Shipping and Receiving Department, and in Insulation Lay-out department. They could also be used as foremen (in time probably) in Shipping and Receiving Department, in Commercial Domestic refrigeration Rebuilding and in Insulation Lay-out Depts.

Not all listed jobs are found in the Occupational Dictionary, but many new job descriptions are attached to the schedule.

February 1942, previous to conversion to war products.

Filed with Manning Table Division
W. M. C.
18th & Pennsylvania Avenue,
Mrs. Dougherty, Librarian.

Firm - Westinghouse Company, Mansfield, Ohio.

Products:

Electric irons, ranges, toasters, roasters, refrigerators, etc.

Occupations listed on which women were employed:

1. Repetitive assembly
2. Plater's helper
3. Inspection
4. Packing
5. Porcelain enamel rimmer
6. Paint cleaner
7. Drill press operator
8. Punch press operator
9. Janitor
10. Clerical work

Oct 21, 1942

ENGINEERING AND ALLIED PROFESSIONAL WORK

Mrs. Mabel McFerran Rockwell, Production Engineer, Lockheed Aircraft Plant
408 S. Spring St., Los Angeles, California

Miss Mary Elizabeth Miller, Engineer, Glenn L. Martin, Baltimore, Maryland

Margaret Ingels, Carrier Corp., Syracuse N.Y. (air conditioning) (First woman in U.S. to get mechanical engineering degree, Univ. of Ky.)

Mrs. Ruth Fallgren, Westinghouse Elec. & Mfg. C o. (drafting of finished designs of turbines) (Enterprise-Beaumont, Texas, 1/21/42)
She also draws gun carriages, howitzers and dreadnaughts.

Miss Olive M. Dennis, Baltimore, Md., Engineer of Service B & O R R
(Only woman engineer employed by a railroad to ride its lines and suggest changes in equipment and service designed to make passengers more comfortable.)

Catherine Ferguson-tests sample bars of new alloys for General Electric, Schenectady, N.Y. (One of her testing machines is the flywheel into which the alloy bar is fitted, rotated at 2400 r.p.m. and then struck with a hammer to test its resistance and strength.) (Graduated from Northwestern University. Studies engineering and metallurgy at night school to fit her for this job.)
(Times, N.Y.C. 12-5-41)

Emily T. Hannan, Head of Turbine Calculations Dept., General Electric, Schnectady, New York.

Also at this plant are: Marie To Richardson, Graduate Engineer
Isabel Lyons, Graduate Architect
General Electric Edith Clarke, Electrical Engineer

Miss Laura Garrison (Has suggested improvements in machinery and processes to speed up production. Awarded $350 recently for an improvement of radio transmitter part. Has netted $500 in such bonuses. Has made 27 suggestions to company 17 of which have been adopted and 3 pending.) (Herald-Tribune, N.Y. 7/25/42)
(New York Times, 8/17/42)

Other Laboratory Workers

Women are employed as chemists, physicists, engineering aides, etc., in the laboratories of various industrial firms of which the following are a few examples:

American Telephone & Telegraph Co.
General Electric Co.
Standard Oil Co. of New Jersey
Oil refineries in the San Francisco Bay area
Goodyear and Goodrich Rubber CO's of Akron, Ohio
Carbide and Carbon Co. of Charleston, W. Va.

Names of a few women: Chemists
Lois Hans, chemical engineer for Hercules Powder Co. (Hercules Powder C o. News Bureau)

Lura Short, research chemist in charge of technical library for Hercules Powder Co. (In last war was one of only a few women chemists).

Other Laboratory Workersm (continued)

Dr. Elizabeth Osman, research chemist doing experimental work for Hercules Powder Co. (Hercules Powder Co. News Bureau)

Dr. Donna Price, experimental work for Hercules Powder Co. (Hercules Powder Co. News Bureau)

Miss Isabel Ebel - In engineering dept. of United Air Lines. Her home is in Brooklyn, N.Y. Attended Adelphi College three years, then went to M.I.T. and graduated in 1932. Took post graduate work at N.Y.U.

FROM: United States Steel Corporation Subsidiaries,
Pittsburgh, Pennsylvania.

FOR RELEASE IN AFTERNOON PAPERS FRIDAY, SEPTEMBER 4, 1942

Oil City, Pa., Sept. 4 - Skillfully-trained women are gradually outnumbering the men employees in the small shell department of Oil Well Supply Company, a United States Steel subsidiary.

Schooled in the technique of milling and threading these high explosive projectiles, a growing production army of attractive, young women attired in slacks is replacing the men called for military service and those upgraded into other divisions of this important war plant.

Months ago, the company foresaw the need of training women to meet the labor demands of an expanding shell production program and a growing shortage of man labor in the community. In cooperation with the local school authorities and the federal and state employment offices, a six-weeks training program was set up at a nearby vocational school. The training includes instruction in blueprint reading and the use of precision gauges such as those employed in the shell department.

To assist in the training, the company provided the school with the services of one of the plant's most experienced inspectors, and workers in the plant loaned the training class precision gauges and other inspection equipment which could not be obtained otherwise. The inspector served as an instructor for the first class and is assisting in supervising the work of the women now employed in the plant.

From the first class of women completing the training course, nine were drafted by the Army Ordnance Department and were qualified as Army inspectors at the plant.

Most of the others are now engaged on the finishing and inspection benches, where the small shells are threaded, examined for flaws, and then painted and packed in boxes. As the department expands and more women are trained, those new on the job are scheduled to replace men now working on other operations in the plant.

The women enjoy two 10-minute rest periods each shift, and to help them relax, the company has furnished a comfortable recreation room with lounge chairs and plenty of the latest magazines.

The small shell department is located in a former warehouse that was stripped to the walls and converted into this direct war effort.

DISTRIBUTED BY: United States Steel Corporation Subsidiaries,
Washington, D.C.

HERALD--TRIBUNE
N.Y.C. Sept. 20, 1942.

STEEL PLANTS LOOKING TO WOMEN TO FILL JOBS OF MEN OFF TO WAR

Steel producers concerned with the prospect of an imminent labor shortage in the industry due to the greatly increasing man power requirements of the armed services, are now frankly hopeful that womanpower will provide the solution. Spokesmen for the industry have emphasized recently that men in the over-draft age group will not be available in sufficient numbers and that women, apparently, thus become the largest potential source for steel work recruits.

These observers also express some confidence that the labor problem arising from the draft may be less difficult of solution for steel than for other industries. An important reason is that numbers of wives of drafted workers probably will volunteer or can be induced to take the places of the men who go to war.

Wives, daughters and sisters of workers called to the fighting services, it is pointed out, probably know quite a bit about the jobs they will be required to fill. Further, they are residents of the community in which the labor need occurs, with no problems of transportation or importation from other areas involved.

So it may not be a question of going back to mother for the drafted steelworker's wife, but of holding down hubby's job until the war is won.

The imminent danger of a steel labor shortage came into the spotlight prominently a few days ago when selective service authorities estimated that by the end of 1943 from 10,000,000 to 12,000,000 men will have been inducted into the armed forces.

Such an enormous draft of man power must necessarily affect all industrial groups. In steel, as in most other heavy industries, the average age of workers is low, under forty years. Giving effect to such factors as indispensable skill, dependency and physical fitness, estimates on the numbers of steelworkers subject to the 1942-1943 draft range as high as 40 percent of the some 700,000 directly engaged in steel output.

The present employment figure, it is noted, is about 350,000 above the level of two years ago. The industry's enlistment of the 350,000 additional workers was effected without much difficulty for several reasons. One was that previously for most of the time there was an actual surplus of labor on most parts of the country. Of more importance have been the company training programs in which consideration has been given, particularly since Pearl Harbor, to the likelihood of shortages caused by increased man-power needs of an Army as the country enters an all-out war stage.

One of the first tangible evidences that steel plant operators look to women to fill work vacancies was given more than a week ago at Gary, Indiana when head of the world's largest steel plant, Carnegie-Illinois Steel Corp., a United States Steel subsidiary, announced a program for employing 4,000 women in new jobs and for the replacement of men taken by the Army. The Gary plant employs 30,000, and the plan, as announced, would build up a force of women workers to 13½ per cent, a ratio found feasible and efficient in British steel plants, where the labor problem has, so far, been much more acute than in the United States.

A few days later, U. S. Steel announced a further opportunity for women - a training program for crane operators, also at the Gary works.

These steps by the leading producer coincide with similar action by other companies in co-operation with the Army services of supply, the Federal Employment Service, the Federal Man-Power Commission, chambers of commerce and other public organizations in the various centers.

U. S. Steel, Bethlehem, Republic and virtually all the large producers are turning to women after the supply of male labor, more particularly of experienced and skilled labor, has been virtually exhausted. Thousands of pensioned employees of these companies have been called back to work or have volunteered to return in recent months, and many of them between the ages of sixty and seventy, but still vigorous, are keeping production rolling. With oldsters who have been continuously employed, they are of first importance in the future labor picture.

The jobs which women can fill in the steel plants, producers admit, are more

or less limited. For some years, companies have employed girls and women as sorters and inspectors in tin-plate operations and in some cases at light tasks in stainless steel divisions. Under war conditions, women will be called upon to handle machines where sheer muscle is not an essential qualification. This would include nail and wire drawing, many kinds of fabricating equipment, cranes and other lifting apparatus and the driving of the industrial tractors which transport products and materials throughout the plants. For these and other tasks, the companies have prepared or are preparing special courses of instruction.

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DISTRIBUTED BY: United States Steel Corporation Subsidiaries,
Washington, D.C.

U. S. Department of Labor
Women's Bureau
Washington

WOMEN IN STEEL MILLS

Extracts from N.B.C. Network, Commando Mary, Nov. 1, 1942

The Carnegie Illinois Steel Corporation at Gary, Indiana has already trained women to operate the giant overhead travelling cranes. The woman must be able to stop a crane above a given point, then drop a great steel hook or set of chains down to the object to be picked up....in fact, she must be able to synchronize six movements at the controls. That's practically being able to make the crane sit on its hind legs and beg. They'll be able to do it because the thing is just like a gigantic clothes wringer and the ingot is passed back and forth through sets of rollers just like the laundry.

Women haven't been used for the heavy work in England and they won't be used here. There won't be any attempt to give women jobs beyond their physical strength. Any woman who lives in a town where there is a steel mill and wants a job, must either register at the U. S. Employment Bureau or go direct to the plant itself. Women are also being schooled as welders, chippers and scarfers who clean off the impurities before it's finished. Women have been used long before the war in steel mills to classify steel. These assorter girls classify sheet steel into four grades. They're particularly good at spotting flaws on the surface of these thin polished sheets of metal.

The work women do in the steel industry takes some training and much of it will be highly skilled work. Take U. S. Steel for instance. Their mills are hiring women as laboratory assistants, estimators, routine chemists, production supervisors and inspectors, clerks of all kinds, and operators of photostat, blueprint and hardness testing machines. Out at Hibbing, Minnesota, the Oliver Mining Company says they're going to want women in the laboratory to test the ore as it's dug from the open mine. The ore all has to be analyzed before it's put on the ore boats to be shipped. If the steel mills can get them they'll take women metallurgists. The difficulty is to find

Women in Steel Mills (continued)

women who have the training to do this or work in the research laboratories where they're so badly needed. The U. S. Steel at Kearney, New Jersey has girls in the labs too. The steel companies are picking them up all around the country for every kind of job.

HERALD-TRIBUNE
New York City
September 20, 1942

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New York Times

March 29

GARY WORKS HIRES WOMEN IN ALL JOBS

2,600 out of 23,000 employes, with some even in open hearth, long a man's domain.

POLICEWOMEN WIN PLACE

Aim Proves Deadly in Gun Drill--Technical, Inspecting and Heavy Posts are Filled

Chicago, March 29--The open hearths and blast furnaces of the Gary(Ind,) works of the Carnegie Steel Corporation for the first time in thirty-five years have admitted women.

There are 2,600 of them among the 23,000 persons employed in the Gary works and the adjoining armor plate plant, which is operated by Carnegie Illinois for the Army.

Women can be found in almost all departments. They are working as laborers and in more technical jobs. For instance, in the open hearth, which has always been regarded as man's domain in the steel industry, women are operating transfer material cars and serving as test carriers, delay clerks, ingot shippers, not to mention transfer car operators, metallurgical observers and carbometer readers.

The carbometer is an instrument which provides for the quick determination of the amount of carbon in the heat of steel.

Women are serving as policemen, patroling the huge areas of the plant. They have been sworn in as auxiliary military police, and their male counterparts who watched them drill admit that their aim is deadly.

A number of women at the Gary works are employed in the rail mill, where an ingot a shape of steel, is converted by eighteen passes into a rail. They are working as cover crane operators, steel chasers expediting delivery, stampers, hot bed operators, inspectors, helpers on light rails and hookers.

Many of them came out of their homes and into the mills as their husbands went to war.

At present, 35 per cent of the employees in the armor plate plant are women, and it is believed that if the war continues long this may rise to nearly 50 per cent. Hot slabs are rolled into finished plate, ready for heat treating in preparation for tank construction.

The women in armor plate are crane operators, flame cutters, checkers,inspectors, hot-bed operators and level operators.

In the Gary sheet and tin mills of Carnegie Illinois, 450 employes are women. They are doing such jobs as assorting tin plate, operating overhead cranes and assorting gas washers, which filter gas. They are aiding in the finishing of heavy plate for tanks, landing mats, deck plates, steel for cartridge cases and other war materials.

In the American Bridge Company's Gary plant, 150 women are welders, timekeepers and inspectors, aiding in the fabrication of steel for aviation, naval and other war purposes. All the plants are United States Steel Corporation subsidiaries.

Slut

EMPLOYMENT OF WOMEN
in the
MACHINE-TOOL INDUSTRY, 1942

The machine-tool industry is illustrative of an industry in which many women may be substituted for men. Until recently the industry has employed no women wage earners. Because machine-tool building was basic to the development of munitions industries, and because its previous methods of production called for highly skilled workmen in the first war years, united effort was exerted to keep the original skilled staff and to add thereto other skilled mechanics.

In view of the industry's importance and recent expansion, the Women's Bureau of the United States Department of Labor made an investigation of machine-tool plants in the summer of 1942. As in its other war industry surveys, the purpose was to find out to what extent and in what jobs women were or would be employed by some typical firms, and to be able on the basis of the kinds of work they were known to be doing successfully elsewhere, to make recommendations concerning the jobs in which the employment of women could be introduced or extended.

Fifteen well-known plants, situated in recognized centers of the industry in New England and the Middle West, were visited. These plants differ greatly in size and make the principal machine tools, that is, milling machines; drilling, reaming, and honing machines; gear-cutting machines; broaches; grinders; and engine, automatic, and turret lathes.

Of the nearly 45,000 workers in the 15 plants surveyed, only 3,544, or not quite 8 percent, were women, and almost 3 in 4 of the women were employed in the plant offices.

Eight of the 15 plants employed women as factory workers. This was, in most instances, an innovation due to the emergency. At date of survey, in the summer of 1942, 2½ percent of all the factory employees in the plants visited were women, and the proportion in the plants where women were working varied from 2 to as much as 8 percent of the factory total. These ratios undoubtedly have increased since the survey, since officials in all the plants employing women factory workers said they were planning to hire more of them and, in addition, 6 of the 7 with no women factory

workers on the pay roll at the time of visit were giving serious thought to their employment.

Following is a list of the factory jobs on which women were employed:

Armature connector--wirer, assembly
Bench grinder--grinding machine oper.
Bench lathe oper.--speed lathe oper.
Bench-punch oper.--punch-press oper.
Blanking machine operator--forming press operator
BRANDERS AND ETCHERS-S2--Sheet metal worker
Broach grinder-
Buffer operator--buffer
Centerless grinder oper.--grinding machine operator
Centerless grinding-machine operator--grinding-machine operator
Chamfer operator--gear finisher
Chamfering-mach. oper.--gear finisher
Check-in-man--time clerk
Check man--time clerk
Chucking-lathe oper.--turret lathe oper.
Chucking-lathe operator, automatic--turret-lathe operator
Cleaning laborer--janitor
Coil winder--winder
Cutter grinder--tool grinder oper.
Cylindrical-grinder oper.--grinding machine operator
Disk-grinder oper.--grinding-mach. operator
Drill-press hand--drill press oper.
Drill sharpener--tool grinder oper.
Drilling machine oper.--drill-press operator
Emery wheel grinder--grinding mach. operator
Engine lathe hand--engine lathe oper.
External cylindrical grinder oper.--grinding machine operator
Filer--burrer
Finish grinder--grinding machine oper.
Fitter--assembler, bench
Gang-drill operator--drill press oper.
Gang-drill-press oper.--drill press operator
Gear cutter operator--gear cutter
Gear cutting machine oper.--gear cutter
Gear generator operator--gear cutter
Gear hobber--gear cutter
Gear hobber oper.--gear cutter
Gear milling mach. oper.--gear cutter
Gear nicker--gear finisher
Gear shaper operator--gear cutter
Gear tooth-grinder--gear finisher
Gear-tooth grinding-machine operator--gear finisher
Gear-tooth rounder--gear finisher
Gear-tooth-shaver oper.--gear finisher
Grinder oper.--grinding mach. oper.
Grinding-lathe oper.--grinding-mach. oper.
Hardness inspector--tester
Horizontal-shaper oper.--shaper oper.
Internal-grinder operator--grinding machine operator
Internal-grinding-machine operator--grinding-machine operator
Jones-and-Lamson lathe operator--turret lathe operator
Keyseater--broaching machine operator
Milling-machine hand--milling mach. oper.
Milling-machine operator, automatic--milling-machine operator
Multiple-drill oper.--drill press oper.
Multiple-spindle operator--drill press operator.
Off-hand grinder--grinding mach. oper.
Package wrapper--packer
Plain-cylinder grinder, external--grinding machine operator
Planer-shaper oper.--shaper oper.
Punch Grinder--tool-grinder operator
Reamer grinder--tool-grinder oper.
Rough-grinder hand--grinding-mach. oper.
Shaper-machine hand--shaper oper.
SHAPER OPERATOR
Single-spindle-drill-press operator--drill-press oper.
Single-spindle oper.--drill press oper.
Spare parts clerk--stock clerk
SPEED LATHE OPERATOR
Stock attendant--stock clerk
Stock checker--stock clerk
Stock counter--stock clerk
Stockroom attendant--stock clerk
Stockhouse clerk--stock clerk
Stockkeeper--stock clerk
Stockman--stock clerk
Stock-service clerk--stock clerk
Stock tender--stock clerk
Storekeeper--stock clerk
Storeroom attendant--stock clerk
Storeroom keeper--stock clerk
Stores clerk--stock clerk
Stamping machine oper.--forming press oper.
Stamping press oper.--forming press oper.
Subassembler, bench--assembler, bench
Supply clerk--stock clerk
Supplyroom clerk--stock clerk
Surface grinder--grinding-machine oper.
Surface-grinder-machine hand--grinder-machine operator

Surface-grinder operator--grinding-machine oper.
Thread hobber--thread-milling machine oper.
Thread miller--thread milling-mach. oper.
Tooth chamferer--gear finisher
Tool clerk--stock clerk
Tool crib attendant--stock clerk
Tool grinder--tool-grinder oper.
Tool-grinding-machine oper.--tool grinder operator
Tool room clerk--stock clerk
Tool sharperner--tool-grinder operator
TURRET LATHE OPERATOR
Turret-lathe operator, automatic--turret-lathe operator
Vise hand--assembler, bench
Wireman--wirer assembly
WIRER (ASSEMBLY) (A,B,C)

U. S. Department of Labor Rotman Return
WOMEN'S BUREAU
Washington

Extracts from

EMPLOYMENT OF WOMEN IN THE MACHINE TOOL INDUSTRY, 1942

Women's Bureau Bulletin 192 - 4
(in press)

Fifteen well-known plants, situated in recognized centers of the industry in New England and the Middle West, were visited in the summer of 1942. These plants differ greatly in size and make the principal machine tools, that is, milling machines; drilling, reaming, and honing machines; gear-cutting machines; broaches; grinders; and engine, automatic, and turret lathes.

About four-fifths of the women found in factory work were in productive occupations such as machining, assembling, and inspecting. The others were primarily in shop clerical jobs such as timekeeping, stock chasing, production control, and the like, or were employed, to mention the more numerous, in service work and in the shipping and store rooms, the tool room, and the tool crib.

The data prove that it is not only in the plants where accessories and other products are made that women can be employed in substantial numbers, although, to be sure, differences in the kinds of machine tools made affect the capacity of machine-tool firms to absorb women in their labor force.

It is a curious thing also that the amount of experience the management has had with women in factory work shows no discernible correlation with the degree to which the scope of women's employment has broadened as a result of the war emergency; three of the firms that have been most progressive in their employment policies in regard to women, opening to them a variety of productive jobs under liberal conditions for the acquisition of skill, had no women on production prior to the spring of 1942.

One firm was planning at the time of visit eventually to place women on almost every type of work except where heavy lifting was required. This included the operation of a variety of machine tools. Furthermore, women were to be hired in this firm as replacements for men, and not to expand the labor force.

Machining employs more personnel than any other division of work, with half of all the men and nearly two-fifths of all the women in production departments. Most of the employees in machining units are operating machine tools, though workers who burr and file, and foremen, supervisors, and general laborers, also are included in the totals.

"Machining" includes operation of lathes (engine lathes, turret lathes, hand screw machines and automatics), milling machines, gear-cutting, grinding, drilling, planing, and miscellaneous work in machining departments.

COPPER & BRASS RESEARCH ASSOCIATION Bulletin

NUMBER 123 OCTOBER, 1942

When RADIO goes to

Right—One of the great eastern plants of RCA working day and night on munitions of war.

Below—Before conversion to war work—television tubes were made by RCA Victor for home receivers.

Charles Phelps Cushing

Below—On the assembly line at the RCA Victor plant—chassis for home television receivers being wired from the under side. Photograph taken before conversion of the plant to war production.

Below—Commanding Officer of the Philadelphia Ordnance District and officials of the Philco Corporation, inspecting a detonating fuse being manufactured by Philco for the United States Army.

Below—Women on the radio assembly line at the plant of the RCA Manufacturing Company. Since conversion of the plant to war production, their experience and talents are used for making munitions.

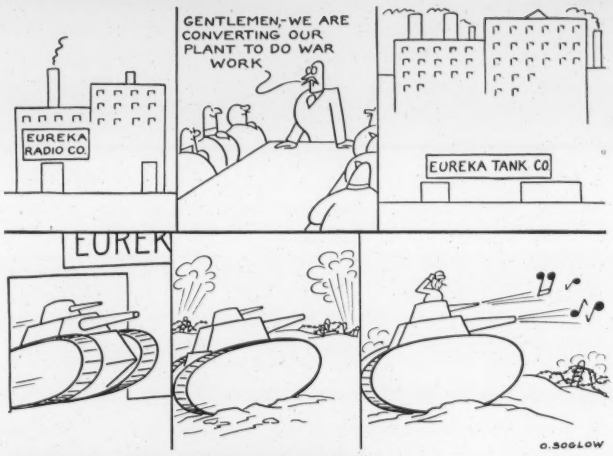
Color photograph on cover — Inspection of Brass Primers at one of the Philco Radio Plants.

to war it fights with Brass . . . .

Since the Pioneer broadcast from station KDKA in 1920 radio has assumed an increasingly important role in our lives. Millions of listeners have found in their radios a source of news, education and entertainment. Since the war started, foreign broadcasts have been almost exclusively propaganda, but in the Americas the programs continue much as in the past.

But the radio industry has undergone many changes. Receiving sets for home use are no longer made. In 1940, approximately 64,000,000 pounds of Copper and its alloys were used for receiving sets alone. Just as this vast quantity of Copper has been diverted into the War Program, so has the Radio industry. Besides the countless numbers of sending and receiving sets required for airplanes, tanks, ships and cantonments and the new "walkie-talkies", radio manufacturing plants are being called upon for the construction of many electronic devices which have important military functions. The nimble fingers of workers accustomed to the close confines of a radio chassis have no difficulty whatever with their new jobs.

Ordnance officers of the Army and Navy were quick to realize that the manufacturers of radios were better qualified than many other industries to make certain types of munitions, particularly those where it is necessary to assemble small parts. An example is bomb fuses, made of Brass, Copper's principal alloy. Like many other basic industries, Radio is working day and night to help equip our armed forces on land, on the sea and in the air, as well as to lend a helping hand to our Allies of the United Nations. And with all this it is still able to keep our broadcasting stations "on the air".



Photos by U. S. Army Signal Corps

Top — Lieut. General William S. Knudsen inspects production of communications equipment for the Army at one of Philco's plants. All the wiring is Copper and many of the other parts are Brass.

Above—Cartoonist Soglow adds a touch of humor to radio's war efforts.

Left — Adroit fingers of skillful women workers assemble the Army's detonating fuse during an inspection of one of the Philco plants.

Above—A train load of armored trucks ready to be sent to an embarkation port for use of our troops on an overseas front.

RAIL

Above—A train load of tanks and tank-trucks of the First Armored Division being transferred South during troop maneuvers.

Below—Unloading caterpillar tractors and 155mm guns at the railhead during the 3rd Army maneuvers at a Southern camp.

From the Atlantic to the Pacific and from the Great Lakes to the Gulf the railroads of the United States have been carrying hundreds of thousands of soldiers and sailors to training camps and to points of embarkation for overseas destinations at fronts all over the world. The freight trains are carrying tanks, planes, guns, munitions and other equipment for our gallant sailors and soldiers, wherever they are. Much additional armament is being sent to Russia, China and Africa.

Copper and its alloys have always been essential in the construction and maintenance of the great railroad systems of this country. How many millions—perhaps billions—of pounds of these metals are in this service can only be conjectured. In the East there are more than 150,000,000 pounds of Copper and its alloys in service on electrified railroads alone. An electric locomotive may contain as much as 75,000 pounds of the red metal. Without Copper, Brass and Bronze the progress made by the great railroad industry would not have been possible.

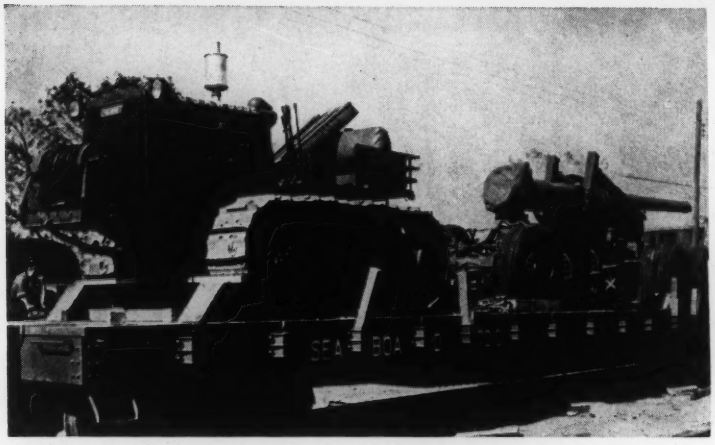
The tanks, command cars, tank-trucks, caterpillar tractors, guns and other armament illustrated on these pages also contain large quantities of Copper and its alloys. The tens of thousands of these vehicles to be built this year must be moved quickly and efficiently to their destinations. The railroads will do this job, and at the same time will move the food and supplies of the nation. In spite of heavy civilian traffic and tremendous troop movements, the railroads are asking for more. It seems a superhuman task the railroads have assumed, but they have promised and are carrying out the promise—"We will deliver the goods".

Photos by U. S. Army Signal Corps

Above—Unloading new Army trucks from railroad automobile cars at a training camp "somewhere in the U. S. A." Only the finest of maintenance parts enable the railroads to keep up the near-capacity schedules required to bring tanks, planes and military equipment to the many bases from the Atlantic to the Pacific.

Above—Army tractors are playing their part in winning the war for the United Nations. The great automobile factories of this country are turning them out by the thousands and they are being sent out to all fronts. Much of the transportation is done by the Railroads.

ROADS keep Munitions moving . . . .

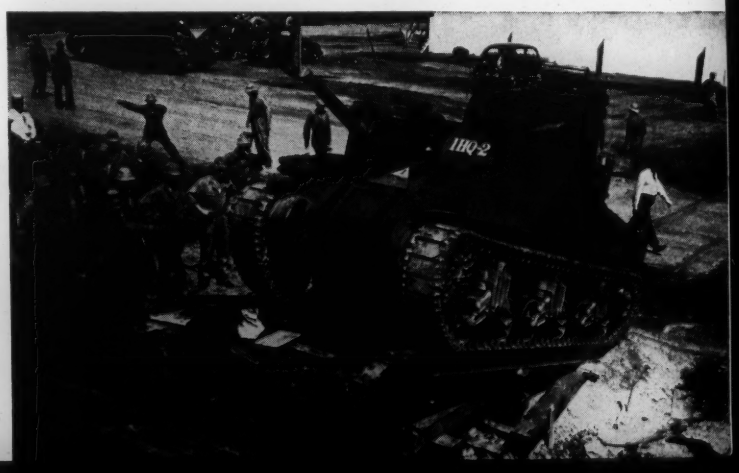


Above—Caterpillar tractors, like the guns they are used to haul, contain many parts of corrosion-resisting Copper and Brass. They function equally well in all climates from the Arctic to the Tropics. Railroads themselves use much Copper.

Below—Great tank battles being fought on the far flung battlefields of this war have brought about the development of some of the strange-looking vehicles whose every line is utilitarian. This heavy armored car is ready to go places.

Above—Command cars are new in modern warfare. Railroad cars specially designed for the delivery of automobiles in peace time encounter no difficulties in handling the varied military vehicles.

Below—Soldiers of the First Armored Division of the U. S. Army, loading a tank on a flat car. It was one of many quickly and efficiently transferred during recent maneuvers in the South.



Gigantic program of the AIRPLANE industry to

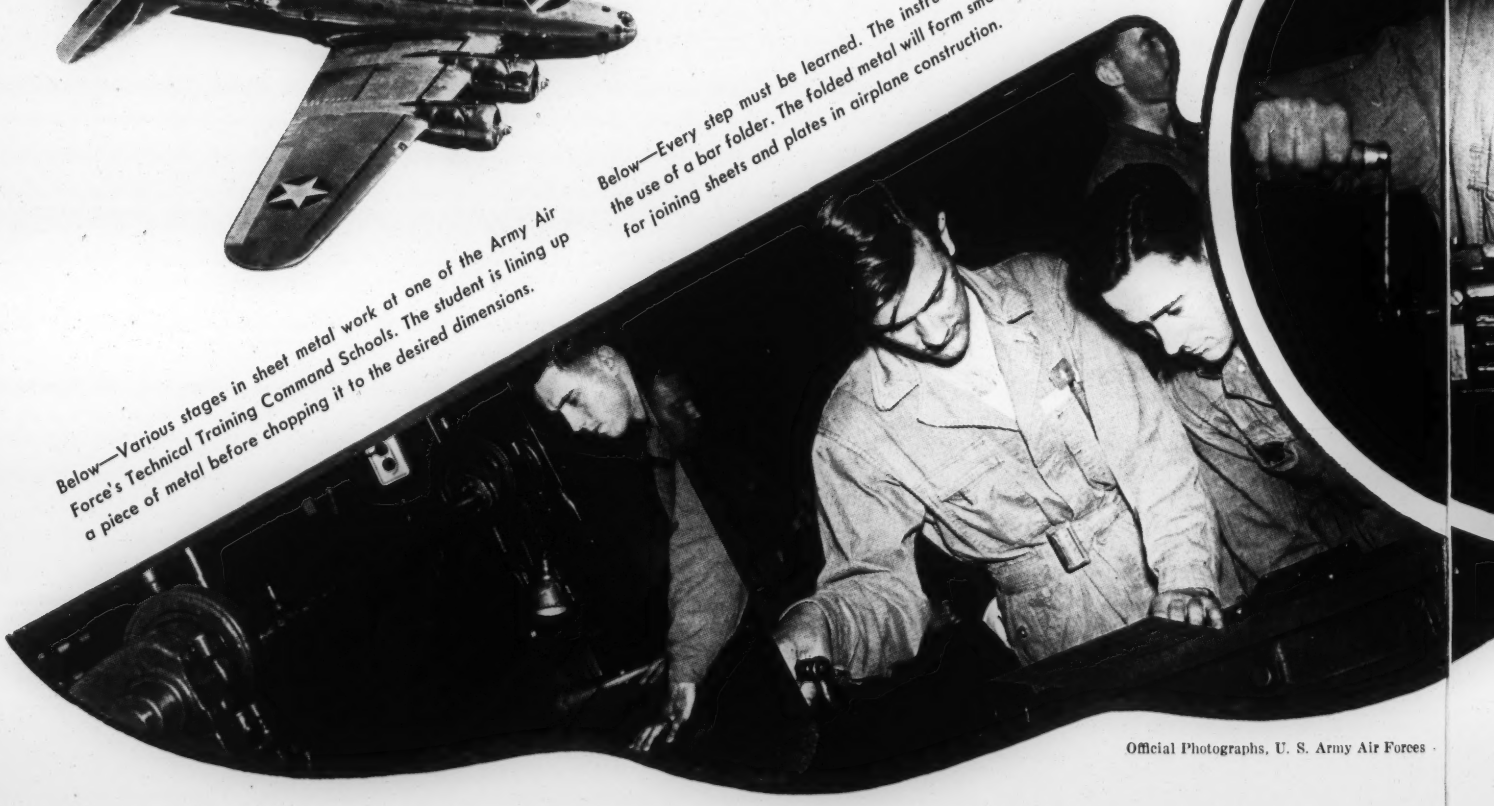
Aviation has become one of the principal weapons of modern warfare and daily accounts reach us of the heroic deeds of our Army Air Forces, who are helping to make history, blasting the Axis in Europe, Africa and the Far East. In addition to flying these ships, Uncle Sam is supplying Flying Fortresses, fighters and other type planes to our Allies of the United Nations. It is estimated that between 50,000 and 60,000 planes of all types will be constructed during 1942, and this number will be exceeded greatly during 1943.

Before our National Defense Program got under way there were only a few thousand men employed in the airplane industry. Today there are hundreds of thousands of men and women so engaged, and women are largely taking over as more and more men are being called into active military service.

Copper and its many versatile alloys are widely used in the construction of all types of planes. A giant bomber contains over 600 pounds of these metals, while the lighter and faster pursuit ships require over 300 pounds. The metal is used for electrical wiring, the many intricate navigation instruments and numerous other purposes. During peacetime years the tonnage of Copper for commercial planes was relatively small, but during the present year millions of pounds of Copper and Brass will be required for the greatest plane program in the world's history.

Curtiss P-40

Boeing B-17 "Flying Fortress"



Below—Various stages in sheet metal work at one of the Army Air Force's Technical Training Command Schools. The student is lining up a piece of metal before chopping it to the desired dimensions.

Below—Every step must be learned. The instructor is demonstrating the use of a bar folder. The folded metal will form smooth, tight seams for joining sheets and plates in airplane construction.

Official Photographs, U. S. Army Air Forces

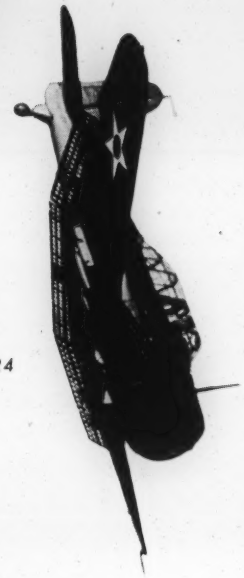
to beat the Axis . . . .

North American B-25

Below—Repairing an engine cowl. The peculiar shapes resulting from streamlining are difficult to work with. Frequently it is necessary for the sheet metal worker to make full size patterns.

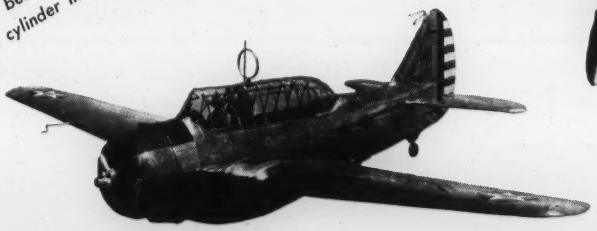
Below—Repairing, as well as new fabrication, must be learned. A damaged fuselage is being repaired with flush type patches.

Above—Experience makes the best teacher. This is a beading machine, being used to groove cylinder metal for stiffening purposes.



Douglas A-24

North American P-51



North American O-47

WOMEN

are now taking over men's jobs in America's War Industries

When the Pilgrims landed at Plymouth Rock, their wives and daughters helped their men folks hew out a living from the stern New England Coast. Many were the privations they underwent in order that they might live and worship as they pleased. Years later, during the great trek westward, sturdy pioneer women stood shoulder to shoulder with their men, fighting savage Indians and establishing their homes in the wilderness. Our freedom is being challenged today and we find the Twentieth Century American women rising to the emergency with the same determination as their pioneer ancestors.

Every fourth woman in America is working today and the number employed is steadily increasing, according to Mary Anderson, Director of the Women's Bureau of the Department of Labor. The total number now working is about 13½ million of whom approximately 2½ million are in America's war employment. That's bad news for the Axis, for in many of our war plants women are doing their tasks more efficiently than the men who have been called to the Colors, and whose place they have taken. This is particularly true in many operations in airplane factories, in assembling and inspecting primers and fuses, (*please turn to page 11*)

Below—Making eyes for the Army—polishing lenses by hand in the optica department of one of the government's arsenals where thousands of sights for guns are being turned out—now a woman's job.

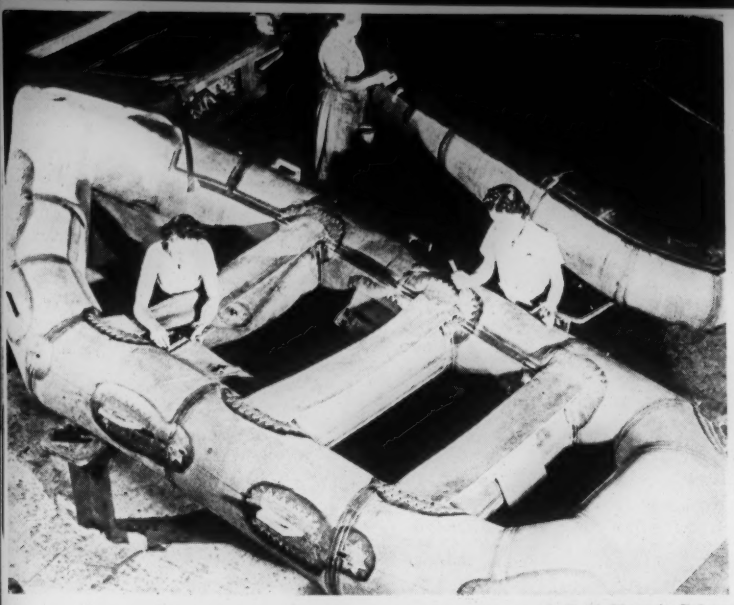
O. E. M. Photos by Palmer

Above—Bending Copper tubes for piping in "Flying Fortresses". By the use of this new "Holly bender" the operator can now easily make 1800 bends per shift with practically no rejects.

Above—Old method of assembly of a part for a carbon dioxide fire extinguisher. All hand-work, the output for this man was 84 pieces per hour. Below—New method worked out by a Kidde employee. Using a motor driven and pedal operated socket wrench, it increases the output to 143 pieces per hour and is so easy a woman can readily do the work.

Below—Many feet of Copper wire and cable are required to assemble these motor control boxes in a factory on the Pacific Coast.

WOMEN



O. E. M. Photos by Palmer

WE'RE FIGHTING FOR LIBERTY!
COPPER
IS IN THE SERVICE NOW

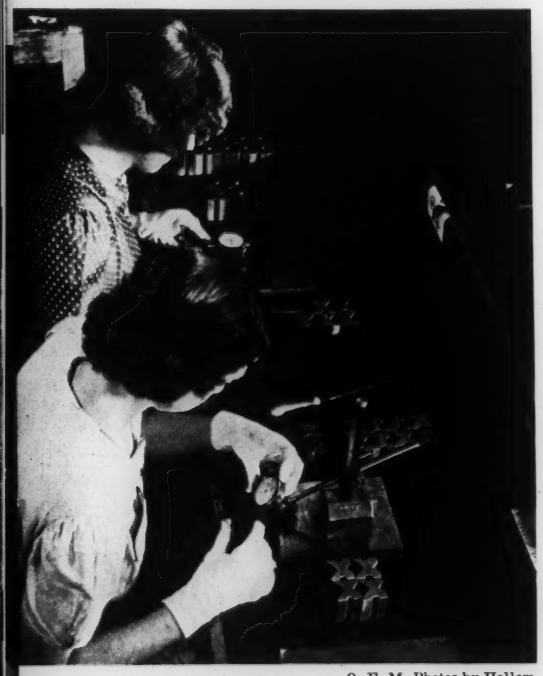
Left—Building assault boats for the U. S. Marine Corps. Women workers in the balloon room, applying seats and accessories to boat while worker in background is applying coat of rubber paint to bottom of boat.

Above—In the plant of a New England safety razor company, many women employees are now operating machines recently converted to production of war essentials. Approximately 2 ½ million women are engaged in war work throughout the United States.

Above—Because of their dexterity in the operation of light-duty machines, women appear in ever-increasing numbers on America's production lines.

Below—From razor blades to V-blocks in a few short weeks—here we see final inspection of V-blocks made by quickly converted machinery of a New England safety razor company.

Left—Assembling airplane instruments at a plant of a West Coast aircraft company. Women all over the country are learning to read blueprints in connection with their war work.

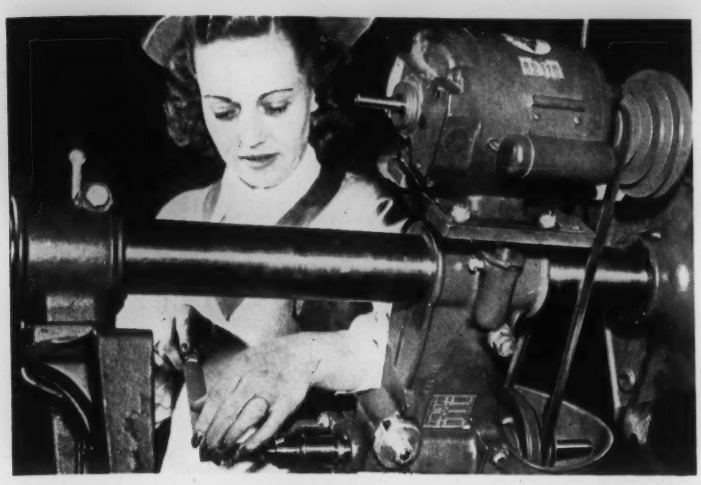


O. E. M. Photos by Hollem

Below — Fitting fabric on wings and fuselages of Vought - Sikorsky fighters. Women have proved themselves particularly adept at this sort of work, which calls for all their talents.

Photo from Press Association, Inc.

find many outlets for their war efforts . . . .

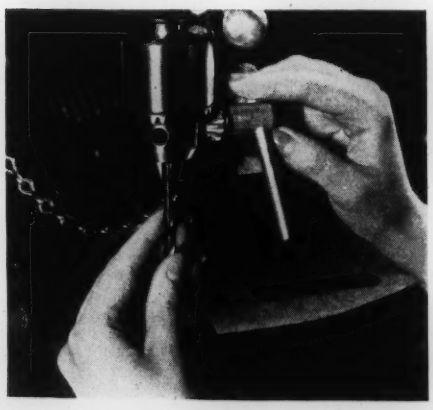


Above—Care of machine tools is just as important as the ability to operate the machines. Hand-work on tools and hand-finishing of small metal parts require much skill. Hand-finishing a metal part for one of our fighting planes.

Left—Operating an electric testing panel. The flashing of a neon light is the signal that a faulty part has been found.

Below — These girls have switched over from making manicure preparations to the manufacture of parts for airplanes. Running tapping machines is easy for these skilled workers.

Below—These hands were commandeered from the nail polish division of a New England company and put to work making vital parts for airplanes. With this drill press, accurate Brass and Bronze parts are being made.

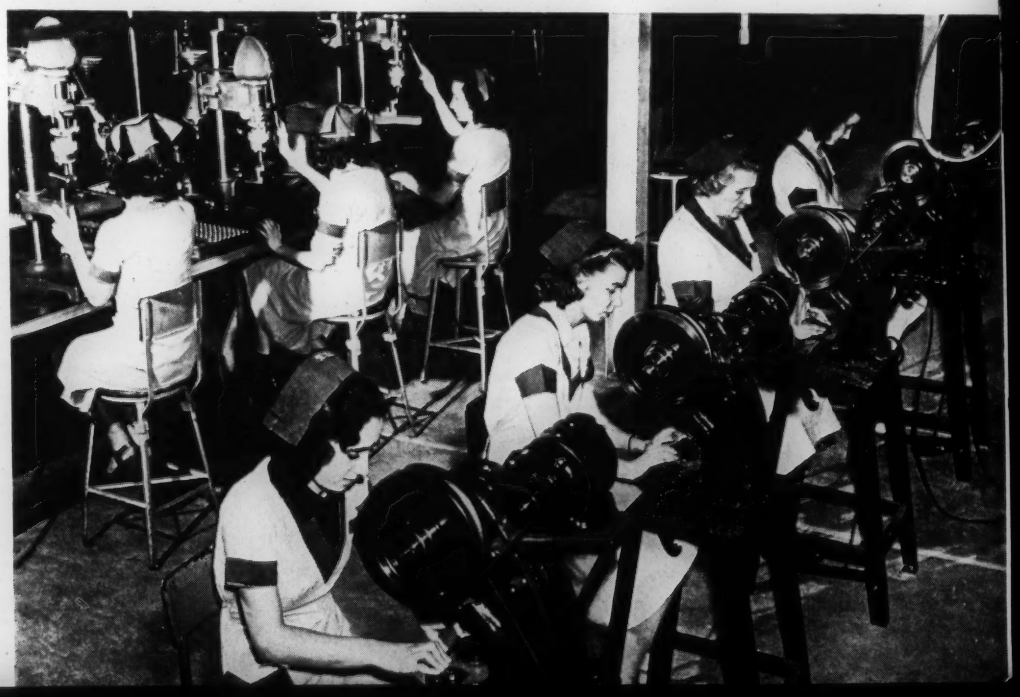


(*continued from page 8*) and many other similar types of work calling for dexterity.

When representatives of the Copper & Brass Research Association recently visited plants producing armament, they found women everywhere doing yeoman service, making Brass primers for artillery shells, Brass bomb fuses, and small arms ammunition, as well as assembling the many Copper parts of intricate electric apparatus, operating small machines of all kinds and taking their place on the inspection line to check that Brass anti-aircraft cartridge cases meet requirements.

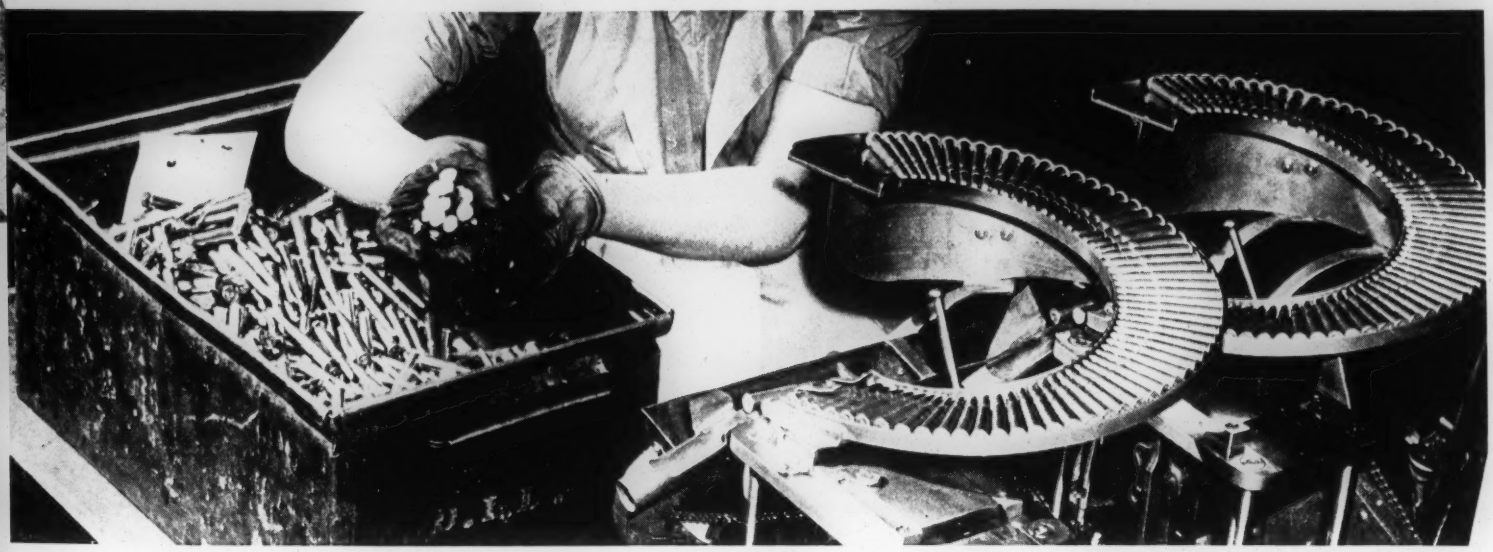
These women are doing more than their bit in helping to win the war. They work on both day and night shifts. At first, executives of munition plants frowned on employing women but now they find that in many instances the men are being outpaced in production. In this work women are processing millions and millions of pounds of Copper, Brass and other Copper alloys so vital to the production of munitions and armament.

In this issue of the Bulletin we bring you many illustrations of the varied activities of these girls and women in the war industry of our country. Thousands of others are in the various women's volunteer branches of the armed services, or are driving ambulances, or doing their part with the Red Cross, USO and similar organizations. Their efforts are behind the men at the fighting fronts and they are going about their jobs with the same fortitude and determination that characterized their freedom-loving ancestors.



CANADA'S women are b

tanks, guns, ammunition and other c



Above—Thousands of women are employed in small arms ammunition production. Plant managers report that in all operations where girls have replaced men, a high standard of workmanship has been maintained.

Canadian soldiers, sailors and pilots played a heroic role in winning World War I and since the outbreak of hostilities in World War II they have been taking an equally prominent part on all the many battlefronts. Because so many Canadians are in the military services, the Government, long before the United States entered the war, appealed to the women of the Dominion to fill the vacant jobs in aircraft factories, shell plants and other war industries. This call was answered, and today thousands of girls and women are working in plants from Halifax to Vancouver. Most of these workers are young girls, many recently graduated from college or high school. To learn their new trades, they have gone back to school where quick technical courses are available. For instance, it only takes a few weeks to teach the art of welding.

The Canadian Copper mines and Brass fabricating mills are working full blast to meet the demands for these most useful and important metals.

Below—Keen-eyed inspectors check dimensions of shells as they near the end of the production line. Each shell has a Copper rotating band.

Photographs from Office of Director of Public Information, Ottawa

Below—New and important job for Canadian girls—wiring instrument boards with Copper wire for Canadian-built Hurricane fighters.

e building planes,

er armament . . . . .

Acme Photo

Left—Brass cartridge cases shipped overseas from Canada are filled with rich powdered milk. The equivalent of 2000 quarts is shipped in a month.

Above—Doing light welding on a Bren Gun magazine at a Canadian munitions plant. Like other welders, this girl took a two-weeks' high school course in welding technique before coming to work ten months ago. She is wearing safety goggles and an arm guard, with which all welders are equipped. Copper alloy welding rod is being largely used in welding these steel gun magazines for rapid fire, anti-aircraft weapons.

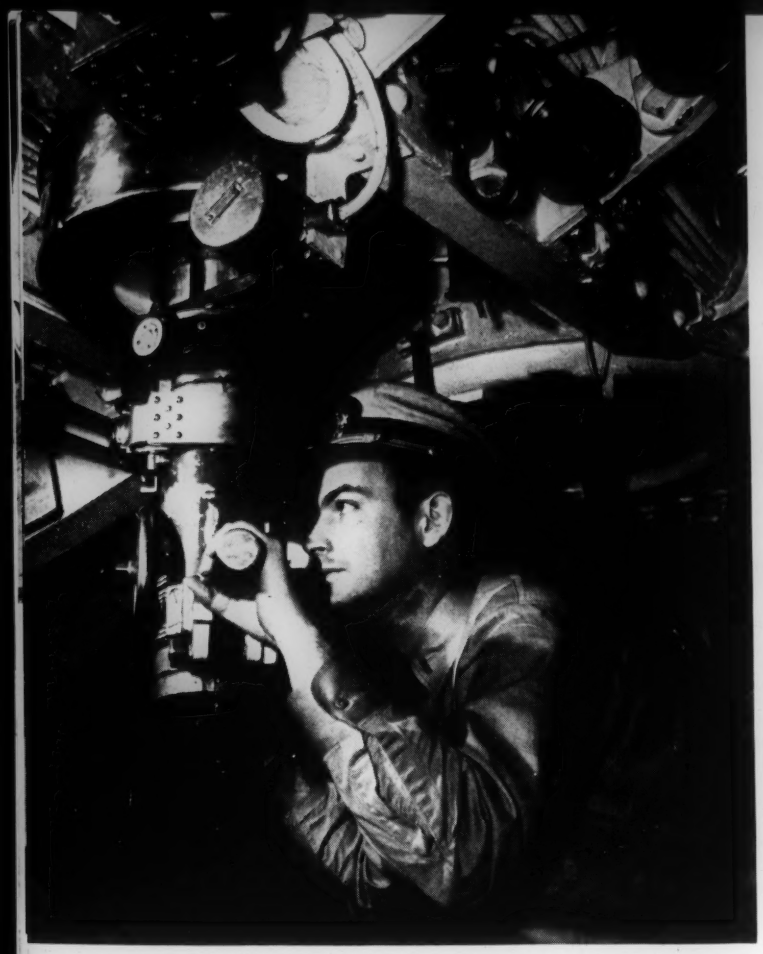
Western Ways Photo

Left—Royal Canadian Mounted Policeman examines the rifling on a bullet in a comparison microscope, which has precision parts of Brass.

Right—As each day brings a faster tempo to war industries, more women are being absorbed into the munitions factories. These girls are inspecting shell cases in one of them.

Below—These girls are checking shells in a government-owned plant near Montreal, one of the largest in the British Empire. Accuracy is vital.

Below—On the industrial front—women are each day playing a more important part in Canada's war industries. Two women are shown processing shell fuses.



NAVY

forces are attacking the enemy and defending our shores

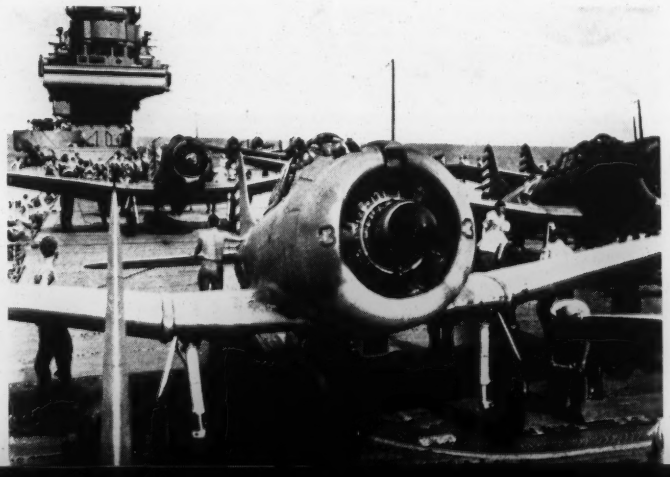
Above—When a submarine dives the Second Officer remains at the periscope. Above right—This old type "O" submarine is used for training, although it has all the modern scientific improvements and instruments.

On All Seven Seas the United States Navy is carrying the fight to the foe. Not only is our fleet slowly but surely driving the Japs back to their homeland, but progress is being made in combating the submarine menace on all oceans.

A modern battleship is one of the most complicated machines known to man. To protect its intricate mechanisms from the corrosive attack of sea atmosphere, much Copper, Brass and Bronze and other Copper-base alloys are used, in fact more than 2,000,000 pounds of these metals are required for a single ship of the line. Its uses are found in all parts of the vessel, from the antenna far above the decks and fire control apparatus in the fighting top down to condenser tubes deep in the hull and the enormous Bronze propellers. Copper will help the Navy win.

Above—War-time scene aboard a modern aircraft carrier — twenty millimeter Oerlikon delivers a real lethal sting to enemy planes.

Right—When preparing to launch planes, the flight deck of an aircraft carrier becomes as busy as a midtown street during rush hours.



Official U. S. Navy Photographs

MUNITIONS are made by women at many government arsenals

Left—Small arms ammunition being packed for shipment from a Mid-Western Ordnance Plant. Each Brass cartridge and primer is carefully examined for defects.

In the Middle West women have responded to the call and are working in many of the Government arsenals and munition plants. These women have come from both the cities and the rural districts to do their part in winning the war.

To release men for heavier work and for military service, girls have taken over many of the operations in these munition plants and have proved particularly adept at such tasks as running machine gun cartridge loading machines and the various assembling jobs where their nimbler hands serve to good advantage.

Millions of rounds of ammunition are being packed and shipped from these arsenals each day and the enormous quantity of Brass consumed is being supplied in part by new Brass fabricating mills recently completed at a number of Mid-Western points.

Below—Brass coils as received from the Brass mills. From these coils many thousands of rounds of small arms ammunition will be produced.

Above—Women workers pack loaded cartridges into machine gun belts at an Army arsenal. Brass is used for the cartridge cases.

Right—A woman arsenal worker loads .50 caliber machine gun ammunition into metal clips, which are packed into wooden cases.

Photos from Press Association, Inc.

H. Amstrong Roberts

Left—Never before in its history has the American Red Cross needed your financial assistance as it does now. The war has increased Red Cross activities and responsibilities on the Home Front. Do your part by making your contributions now.

Right—One of the rolling representatives of the USO, which bring to thousands of men, stationed on lonely outposts, food, hot coffee and other refreshments, or cooling drinks on tours of duty during warm weather.

Left—Join the Brass Mills in forming a 10% Club. Just as each Brass slab adds to the ammunition to be used against the enemy, so each bond you buy adds fuel to the fire of America's freedom. If liberty is worth fighting for it is worth paying for—buy WAR BONDS.

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WOMEN IN WAR INDUSTRIES

By

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INDUSTRIAL RELATIONS SECTION

Department of Economics and Social Institutions

PRINCETON UNIVERSITY

PRINCETON, N.J.

1942

INDUSTRIAL RELATIONS SECTION
DEPARTMENT OF ECONOMICS AND SOCIAL INSTITUTIONS
PRINCETON UNIVERSITY
Established 1922

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The reports of the Industrial Relations Section are the joint product of the Section's staff under the supervision of the Director. In the case of each report, the research and preparation of manuscript is done by the staff member whose name appears on the title page.

Research Report Series: No. 66

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INDUSTRIAL RELATIONS SECTION
PRINCETON UNIVERSITY

FOREWORD

THERE is general agreement that the answer to the great potential gap between the need for and supply of industrial manpower in America is *womanpower*. So it has been abroad in countries long at war. So it is bound to be, if we must send millions of young men to a score of fronts and at the same time serve at home as the arsenal of democracy. The process of shifting jobs from men to women is already well started. From all sides favorable comments are heard concerning the quick adaptability and effective performance of women in hundreds of new tasks. During the quarter of a century since the last World War, attitudes, education, management methods, shop conditions, and many other factors have made the transposition of millions of women from home to factory far easier than in 1917.

The inevitability of the shift to the employment of women for the first time in a large part of industry does not mean that it should occur in an unplanned, hit-or-miss surge. Patriotic emotions are no substitute for intelligence but rather a driving force for the sustained exercise of intelligence. The tasks to which women are assigned must be studied in relation to women's aptitudes, attitudes, and capacity just as any job at any time must be analyzed to be adequately manned. Many processes may need to be reengineered in order to employ women. This is not startling at a time when great new plants are being designed to manufacture new products in untold numbers. Probably the greatest need of planning will not be in the plant but in the community. The shift of women from home to factory is not merely an economic change in the labor market but a critical change in social arrangements. Neither the employer nor the community can ignore the social aspects of the shift nor fail to assist in their solution.

In its study of industrial relations in war industries, the Industrial Relations Section began to observe in 1941 an increasing number of problems connected with the employment of women in new situations. On account of the increasing importance of the subject, a special study was begun in October, 1941. A preliminary report based on the findings of that survey was issued in February, 1942. Since then up-to-date information has been received from the companies in the original survey

and from other sources in this country, and all available reports on British experience with the war-time employment of women have been studied.

The following report seeks to summarize the principal personnel problems facing industry in connection with the greater employment of women and to evaluate the methods which have been used to meet these problems in the United States and Great Britain. It is hoped that the report will be of value to industrial executives who must adjust their policies and operations to the extensive replacement of men by women, and to government and trade union officials assisting in the change.

The Industrial Relations Section wishes to express its appreciation to the government, industrial and union executives who helped to make this report possible, and particularly to those who read the preliminary report and checked it critically against their day-to-day experience.

J. Douglas Brown
Director

Princeton, New Jersey
May 25, 1942

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I. INTRODUCTION

THE employment of women in the production of all kinds of war materials is now taken for granted. In many cases, companies which only six months ago were questioning the feasibility of using women on production jobs and definitely putting off the evil day as long as possible are now enthusiastically praising their new women employees who not infrequently are turning out more airplane parts or guns or shells than the men with whom they are working. Women defense workers are now a popular subject for headlines—in the daily newspaper, the employee magazine, and the labor journal. Government reports reveal more factually the conditions which affect the rate of acceleration in the employment of women, and show an increase both in the number of women in defense production and the types of work to which they have been assigned. The gap between the acceptance of the idea of women as an important part of the war labor supply and their successful induction into individual plants may, however, often be a difficult one to bridge. The much more extensive use of women in companies which have previously employed women naturally involves fewer problems than the first introduction of women into a factory. Even in the former circumstances, however, the emergency need for rapid expansion with as much increase in individual productivity as possible may necessitate a review of employment policies, selection procedures, hours' and wage schedules, and working conditions.

To be of assistance to companies facing such adjustments, the Industrial Relations Section of Princeton University undertook in October, 1941 an intensive survey of current problems and contemplated changes in policies among a selected group of companies. The 62 firms studied at that time included a number which had employed women in many types of work for a long time, many which had used women only on a few factory jobs, and others which had begun to employ women on production work for the first time in 1941. For the most part, these companies had better than average standards in industrial relations policies.

One outstanding fact evident in the late autumn of 1941 was the different degree to which companies had felt the need for replacing

men by women depending on the impact of the war effort on the particular company and community. In communities where some industries were going along almost as usual, even though nearby defense plants were expanding rapidly, the question of the employment of women was considered a minor one. In other communities in which defense industries were predominant, the already tight labor market had resulted in a more rapid employment of women, sometimes on all three shifts. The conditions observed in these companies and communities are beginning to appear more generally and seem to be typical of problems which a majority of companies will have to face as the war effort is accelerated. Since the percentage of women now in war industries is likely to be multiplied four or five times before the war is over,[1] the situation faced by companies at the moment most advanced in the employment of women is perhaps not as complex nor as difficult as the situation will eventually be for all industries in which women can be employed.

To get as clear a picture as possible of current conditions and likely future developments, the 62 companies from whom information was secured in late 1941 were asked for information on any outstanding changes after our entry into the war. In addition, the Industrial Relations Section received information on specific policies relevant to the employment of women from as many more companies as were originally surveyed, and all available printed reports, articles, and recommendations in this field were studied carefully. Since much of the British experience with the employment of women in the last war and its longer experience in this war show approaches to problems that might profitably be weighed in seeking solutions to similar problems in this country, all available British material was also reviewed.

From the beginning of the study, two aims were kept in mind in seeking information from all sources: (1) how personnel and labor relations have been or are likely to be affected by the great increase in the employment of women, and (2) what is accepted as sound policy and good practice by companies which have earned for themselves the reputation of maintaining high standards in industrial relations. As the study developed, the need of a third approach began to be evident. That is, (3) how a company can cooperate with community or government agencies to improve conditions outside the factory which may affect industrial production almost as much as the personnel policies of the individual concern. Some of these conditions

[1] See Testimony of Thelma McKelvey before the Tolan Committee on "Women in War Production." February 4, 1942. p. 47.

affect the employment and productivity of both men and women; others are particularly related to and accentuated by the increasing number of women in industry.

In the following chapters an effort has been made to outline the principal problems facing industry in connection with the much more extensive employment of women, to show the various adjustments which companies have made in their personnel policies to meet the new conditions, and to summarize the policies and procedures which have proved most effective either in this country or in Great Britain in securing the *satisfactory* and *rapid* induction of women into war industries.

II. SELECTION AND PLACEMENT

THE careful selection of women for industrial work is just as essential and in some respects more difficult than the selection of men. The records of higher turnover and absenteeism among the women employees of many American and British concerns are evidence of the need for improved employment procedures to weed out the applicants who are not likely to prove adequate for the job. The usual basis for judging applicants—previous related training and experience—can be applied to women much less frequently as women not previously employed enter the labor market. The conclusion drawn from the information received in October and November, 1941, was that little had been done in the wider use of employment tests or more detailed interviews of women applicants to offset this lack of previous industrial experience. In more recent months, however, as companies have begun to recognize the inevitability of a much wider employment of women, employment procedures have been weighed and re-studied more frequently. The use of employment tests appear to be increasing, and companies with considerable experience in the employment of women are observing that more detailed information on an applicant's background must be secured when previous restrictive employment policies are modified.

A. Recruiting

Comparatively few companies have thus far experienced any shortage in women applicants. There are outstanding exceptions in some communities where from the beginning of the defense effort women were employed in large numbers, and in the case of expanding or new factories in smaller communities. Where the individual firm has had no dearth of female applicants, they have continued to follow their usual recruitment methods. Present employees have been a good channel for spreading news of job openings, and public schools have been notified of openings for which a high school education or some special vocational training was desired; private agencies have been used more for office than for production workers, and newspaper advertisements have been tried particularly for jobs for which some unusual experience or training was required.

The experience of the minority of companies which have already had difficulty in getting enough of the right kind of women employees is doubtless more typical of conditions which most concerns will meet as defense production speeds up and more young men are withdrawn from industry for service in the armed forces. These companies have used more intensively all of the methods of recruiting mentioned above. Perhaps the most significant development in this regard in the past few months is the greater dependence upon the United States Employment Service offices as community labor markets become tighter. Companies which had previously reported openings to the local employment office, but continued to use other recruiting methods and gave no preference to individual applicants referred from the public employment office, have in a number of instances begun to depend primarily on referrals from the employment office. Where new plants are built, the procedure is more and more to use exclusively the public employment service for recruiting and preliminary selection.

Whether the public control of the registration and employment of women will progress as far in this country as it has already gone in England is still a matter of conjecture, but considerable thought is being given to voluntary registration.[1] British opinion seems to have been in favor of the registration of women before it occurred, and compulsory registration has been considered important not only in getting sufficient workers but in matching special abilities and jobs. Such a development here will depend primarily on the degree of difficulty war industries have in securing sufficient women workers without compulsory registration. Present indications are that newspaper and radio publicity has "glamorized" industrial defense work to such an extent that in some communities the flood of women applicants has been almost embarrassing to the employment offices and war industries. If this voluntary influx of women into industry continues and companies cooperate closely with the Employment Service towards their most efficient distribution and placement, compulsory registration may be unnecessary.

In England, the transfer of women from one community to another has been most difficult. Frequently the women have not liked the idea, and the government has found that arrangements for housing, medical care, restaurants, and recreation are all greatly complicated by transfers. British experience and the problems already evident in the United States in connection with the migration of war workers make it clear

[1] The voluntary registration of women has been undertaken in Connecticut under the auspices of the State Defense Council, assisted by the United States Employment Service in Connecticut.

that our planning for the absorption of women in industry should as far as possible aim to use local women. Voluntary entrance into industry may also insure more enthusiastic workers. An English woman who agreed wholeheartedly with the conscription of women wrote, "It is useless, however, to compel unwilling women to enter industry; wages and conditions, inside and outside the factories, must act as incentives to women, not deterrents."[1]

B. Employment Policies

During the depression years, adjustments were made in employment policies primarily to discourage and limit the number of women in industry. With a sudden change to the opposite need, many policies are being revised. In late 1941, a considerable lag between the changed conditions and changed policies was apparent, but adaptations have been much more frequent since December. The principal policies affecting the use of women in industry which indicate current trends are as follows:

1. *Age limits*

The lower age limit of female employment is usually set by state law at 16 or 18, with 18 the more common minimum for industrial employment in states in which defense industries are concentrated. In addition to the minimum hiring age, there may be legal restrictions as to types of employment and hours of work for females of 16 and 17, and 18 to 20 years, that make it impractical for companies to hire production workers from the under-21 age group. Relaxations in state hours' laws in a number of cases permit exemptions applicable to females of 18 or older, but the consensus of opinion seems to oppose any relaxation of laws affecting the industrial employment of girls under 18.[2]

Although the upper age limit for women is being raised with the increasing demand for women in industry, it is evident that most companies still have a lower top hiring age for women than for men. In November, 1941, many companies reported 30 or 35 years as the upper age limit. The reasons given for restricting employment to young women were that the men workers and foremen accepted the increasing number of women in the shops more readily if they were "young

[1] Gauntlett, Pamela J. "A Survey of the problems of the employment of women in war-time." *Labour Management*, February, 1942. p. 23.

[2] An exemption to the provision of the Walsh-Healey Public Contracts Act, permitting employment of females between 16 and 18 years of age in certain industries and under specified conditions, was made by the Secretary of Labor on April 23, 1942. See: *Wage and Hour Reporter*, April 27, 1942. pp. 316-317.

and pretty," and that the younger women were stronger, much more adaptable to new work conditions, and could be trained in a considerably shorter time. In contrast, a number of companies reported that they had no definite upper age limit and gave preference in employment to women with previous factory experience even though they might be 40 or 45 years of age. More recently an increasing number of employers have expressed the opinion that a woman's previous experience and physical condition are more important than her age in shortening the learning period and keeping down labor turnover. One British woman's point of view on this is, "There should be no upper age limit; employers have found . . . that although older women are comparatively slow in learning skills that involve finger agility, this slowness is more than offset by their enthusiasm, determination and sense of responsibility."[1]

2. *Education*

Information received since December on the question of educational requirements for women production workers indicates that the standards are being lowered slightly. Approximately one-half of the companies reporting on the question in November required a high school education before employment and others expressed a preference for young women with that much formal schooling. Other companies stated that their educational requirements varied with the job but that applicants were not considered for employment unless they had completed eighth grade. The reasons given for preferring high school graduates did not show any direct relationship between the high school training and job requirements, but a belief that such an employment policy "improved the status of factory jobs" and assured the hiring of girls with sufficient intelligence to learn the work quickly. One company which was having difficulty securing enough female applicants dropped the eighth-grade requirement for a short time, but soon adopted it again as one of the simplest guides in weeding out those whose learning capacity was definitely too low.

College training was mentioned by very few companies in connection with production jobs. However, a few concerns which were employing women in the plant for the first time tried to get at least a sprinkling of college girls. The objective was to get a nucleus of as "nice" young women as possible to give prestige to industrial war work. One company was definitely recruiting college women for factory work, planning to advance them as quickly as possible to supervisory

[1] Haslett, Caroline. "Women in wartime Britain." *Factory Management and Maintenance*, March, 1942. p. 62.

jobs. On the other hand, a number of companies which were not promoting women into supervisory work refused to employ any women with more than high school training for fear they should become dissatisfied with the routine work to which they were limited. Such a policy is in accord with the earlier experience of many department stores which found that employment standards for education and intelligence should be determined largely by the types of work and promotional opportunities, but perhaps overlooks the patriotic motives which encourage many women to accept work in war industries in which they would have no interest in normal times.

The pre-employment vocational school training of women is increasing rapidly. While the majority of executives with whom this question was discussed felt that such training would be helpful in shortening the in-company training period, very few have made special vocational training an employment requirement. In communities where defense courses are now open to girls and women, companies which are only gradually taking on women are beginning to give preference to applicants who have taken these courses. The concerns which are taking on women most rapidly seem to have adopted two diverse policies. On the one hand, they cooperate very closely with selection of trainees for the technical school and assure employment for all who finish specified courses. On the other hand, some companies feel that they can get the available workers to a production level more quickly by in-company training and that with careful selection procedures they do not need the pre-employment training as a test of work ability.

3. *Marital status*

The restrictions against the employment of married women seem to be changing more rapidly than any other one employment policy affecting women. A number of companies which had definite rules against employing married women and requiring their resignation after marriage have either dropped both rules or have made the first step in this direction by permitting and encouraging their women employees who marry to continue on their jobs. Other employers who gave preference to single women have dropped this policy, but in their interviews with married women applicants try to find out about family responsibilities which would be likely to affect the woman's stability on the job. A few companies refuse to employ mothers of young children. However, others feel that women with dependents are the most satisfactory employees *if* the children are adequately taken care of so that

the mother need not worry about them nor have to take time off when they are ill.

4. *Relatives of present employees*

A large proportion of the companies from whom information was received on this point have no objection to the hiring of relatives of present employees as long as a supervisor has no relative working under him. Only one company reported a rule which forbids the employment of any close relative of any supervisor in the plant. A considerable number of concerns give preference in employment to relatives, and under present circumstances, particularly to the wives and daughters of present employees. One differing point of view was that to hire a husband and wife might create a disciplinary problem and that if one was dismissed for cause the other would quit, causing a higher labor turnover. However, many more companies felt that hiring female relatives of present male employees was a sound policy for three reasons: (1) it increases the local labor supply without affecting housing requirements; (2) it brings in new employees who are already acquainted with the company and who are likely to be as satisfactory employees as their male relatives; and (3) it may help to minimize post-war readjustment since wives of employed men are not looking for permanent employment.

C. Selection Procedures

Good selection procedures are fundamentally the same for men and women. The companies from whom information was received included both those with carefully planned and well administered procedures and others where the expansion had caught the company unprepared and resulted in emergency selection methods admittedly below a desirable standard. As suggested above, the tendency is more and more for companies to use the services of the public employment office for preliminary selection. In new plants, particularly in non-industrial areas, the entire selection process for the rank-and-file workers may be handled in the public employment office. More frequently, however, companies with well established employment departments use the public employment office only for the preliminary selection. Additional interviews, tests, and physical examinations are given as usual by the company.

1. *Interviews*

The standard employment procedures reported by companies with well organized personnel departments include three interviews—a preliminary one at the public employment office or in the plant employment

office, a second more exacting interview by an experienced member of the company's employment staff, and a final check by the supervisor or department head under whom the applicant will work if employed. A job specification and an application form, revised according to current requirements, are essential tools for the interviewer. The applicant may be asked to fill in a very short form for the preliminary interview and the longer application form before the principal interview.

It has been pointed out by a number of companies that in the case of women applicants, the principal interview must bring out not only information supplementary to that given on the application form and essential to a decision as to a person's work ability, but also additional information as to a woman's living arrangements and home responsibilities which would affect her attitude towards and productivity on the job. Today, also, when women are being placed on new work, the interviewer must know what types of related experience are most helpful, and give the applicant enough information about the job to find out from her whether her interests, if not her experience, make her suitable for the job. A few companies have also suggested that it is a help in keeping labor turnover down to weed out through careful interviewing the women "who want to earn a little extra money" only for a few weeks or few months.

Companies in this country differ on the question of whether men or women interviewers are most successful in the selection of women. The British Ministry of Labour and National Service recommends that a "woman personnel officer should be made responsible for interviewing, selecting and engaging women . . .", and apparently such a policy has long been accepted by many British companies. The advice of the United States War Production Board, Training within Industry is somewhat different. A recent bulletin stated:

> "Women are entering war production on the same terms as men. . . . Their relation to the personnel department is the same as new men. Women have a useful place in personnel offices, but not necessarily as concerned with women employees."[1]

By and large, industrial relations men seem to agree with that statement. One personnel executive said that a woman was likely to be too critical in interviewing other women and to reject too many applicants. Yet it is evident that women employment assistants and managers are much more frequent in industries employing many women. Whether due to their natural interests or to closer association with the women

[1] War Production Board, Labor Division, Training within Industry. Bulletin No. 7. p. 3.

employees, the women employment officers who were interviewed showed the most detailed acquaintance with family and household responsibilities of the employees and with community housing and transit conditions which complicate hiring, shift assignments, and attendance.

2. *Tests*

Intelligence tests are a part of the employment procedures of only a small proportion of the companies from whom information was received, and the use of temperament tests was reported by even fewer. Apparently no distinction is made by sex in determining the use of these tests. Other companies consider a minimum educational requirement adequate to weed out applicants with insufficient intelligence to learn the production jobs and feel that the interviewer can spot many of the applicants who might become problem employees. Where intelligence tests are used, an I.Q. of 90 has been mentioned as the minimum acceptable, and one company stated that anyone with an I.Q. of more than 120 was watched for promotion or placed at once in an office job.

Aptitude tests are used by a slightly larger number of the companies reporting, and their use for women applicants is expanding as women are increasingly being placed on work requiring some mechanical ability or special dexterity and involving considerable training. The value of mechanical aptitude and finger dexterity tests in selection for certain jobs is unquestioned. There are, however, differences of opinion as to their usefulness in selection for repetitive and assembly jobs which require little skill and perhaps a very short training period. Because women production workers were predominantly on this type of work, mechanical aptitude tests have in the past been used less frequently in their selection. However, a number of companies consider aptitude tests a particularly important aid in the selection of inexperienced women applicants for semi-skilled jobs and inspection work and have developed their own tests or adapted to their specific job requirements standard tests to measure speed, accuracy, steadiness, finger coordination and dexterity, and visual and touch perception.

It has been suggested that companies without any previous experience with employment tests might, in the emergency expansion, use the testing service of public employment offices more advantageously than develop their own tests. The criticisms of the public testing service have been (1) that it sometimes is slow and delays hiring, and (2) that the tests are not always as well related to the specific job requirements as is essential if they are to be of real value. In spite of

these criticisms there is a growing reliance upon United States Employment Service offices for preliminary selection, and with it tests may become more generally an accepted procedure, especially in the case of women applicants with no previous related job experience.

3. *Physical examination*

More than half of the companies surveyed include a general physical examination as part of their employment procedure, but a number stated that their examination of women applicants was not as thorough as for men unless the women were to be placed on hazardous work. Some concerns which do not require a complete physical examination give a variety of eye tests to women applicants for inspection work. Although one company employing a large percentage of women had dropped physical examinations as an unnecessary expense, other companies were considering more thorough examinations for women. In general, the reported experience and statements of opinion favor a pre-employment general physical examination for all women employed in factory work, with additional special eye tests for inspectors and other individuals who may be placed on work requiring both good eyesight and strong eyes.

III. INDUCTION AND TRAINING

THE number of courses available and the number of women being trained for industrial defense work have increased strikingly between December, 1941 and April, 1942. This is true both of preliminary training offered by public vocational schools and in-company training programs. While women continue to be employed most frequently for unskilled work, many companies have begun to recognize the need for upgrading women and are considering the best methods for such training. Women are also now accepted in more "learner's groups" to be trained for semi-skilled jobs and are in a number of instances being encouraged to enroll in outside courses to prepare themselves for promotion to skilled work. The chief weaknesses of training programs for women in war industries appear to be two: (1) insufficient advance planning which results in a lag between the need for women prepared to handle specific work and their availability, and (2) frequent lack of centralized formulation of policies and administration, which permits an unevenness of training even within one plant.

A. Induction of Women into Factory Employment

Executives of plants which have not previously employed women in factory work generally agree that there should be some preliminary discussion of this move with the supervisors and workmen and that women should be helped as much as possible to make a quick adjustment to the working environment. A number of companies which made special efforts in these matters reported that the transition had been made with much more ease than had been anticipated.

1. *Advance discussion with supervisors and unions*

While the first suggestion of the prospective employment of women in a plant seems often to have aroused some objections on the part of a few of the supervisors and, in some cases, of the union leaders, the unmistakable need for a new supply of labor has usually brought agreement to the proposal without much delay. The discussion of the prospective move with the foremen of the departments in which women are to be placed and with the union affected is considered all that is

necessary by many companies. However, a few companies have made plant-wide surveys discussing with every foreman the possibility of using women on work in his department as well as his own feeling towards the introduction of women and any problems which he might foresee. This not only forestalls any resentment on the part of the foremen, but gives top management the benefit of their judgments on necessary readjustments of the job process and on the best placement of women in the plant.

The attitude of unions has varied, depending primarily on the current state of the labor market. When men union members are out of work because of the transition from non-defense to war production, the union leaders have usually demanded that the men be re-employed before women are permitted to take over any jobs normally held by men. In exceptional cases, where women form a considerable percentage of the membership, local unions have recommended that displaced men and women be given equal opportunities for retraining and reemployment. As the supply of labor has become scarce, union leaders have accepted as necessary and inevitable some use of women in jobs ordinarily held by men. The individual "grumblings" against the introduction of women have, according to a number of companies, come principally from the older men and have rarely lasted long after the women have begun work.

2. *Orientation of women employees*

Differences of opinion and policy were found concerning the segregation of women by department or within a department. Some companies felt that it was best to use women principally within a few departments and to have them work in separate sections from the men. Their reasons were that with this arrangement the men resented their presence less, that the discipline would be easier, and that the women would feel more at ease. Other companies give almost the same reasons for placing women in the department wherever the work space for the job would normally be. In particular, one company found that men working with the women were much less distracted by their presence than men in nearby departments in which there were no women. As women are put into a greater variety of jobs, more companies seem to be accepting as a matter of course that women will be placed wherever the job is normally located.

However satisfactory the masculine acceptance of women fellow workers, the individual woman employee needs help in adjusting to the job as quickly as possible. Many companies have pointed out the need

of good induction procedures for all new employees, but consider it especially important in the case of women who have had no previous factory experience. The orientation courses set up by these companies are always brief and have as their principal objectives: (1) to give the new employee information on rules, grievance procedures, benefit plans, available medical services, and employee clubs; (2) to acquaint her with general safety instructions and special clothing requirements; and (3) to tell her enough about the company, its products and its relation to the war effort to help her relate her own work to the need for "all-out production." After the group instruction, the new employees are guided to the work department, shown how to operate the time clock, shown their locker space and the location of rest rooms, and introduced to the foreman, who in turn introduces them to their job instructor. A number of executives have stressed the importance of a friendly introduction to rules, plant procedures, and the "boss," in minimizing labor turnover and helping the worker to attain maximum productivity as quickly as possible.

3. *The use of women personnel advisers*

The British Ministry of Labour and National Service has recommended to employers of women that a woman personnel officer should "assist in securing the mental well-being of the women, by keeping in touch with them especially during the first month of employment, and eliciting by conversation any worries or grievances they may have,"[1] and this arrangement seems to be considered most desirable by British companies.

The companies in the United States which have already hired women in this capacity have given them such varying titles as "girls' counselor," "personnel assistant," "special interviewer," and "social worker." One small company which has assigned to the head nurse the responsibility of getting through the plant regularly to talk with the new women employees feels that important qualifications for such a job are sympathy and an intelligent understanding of management problems at the production level. One personnel adviser in a plant which has only recently begun to employ women stated that they sought practical information from her in adjusting their home responsibilities to new hours of work, gave suggestions which management might be able to use in making the working conditions more satisfactory for all the women employees, and seemed to appreciate greatly the chance to discuss questions which they would have hesitated to mention to the foreman.

[1] *Employment of women—suggestions to employers.* March 24, 1941. p. 2.

As the war brings into factories many women not usually employed outside their homes and multiple shifts complicate living arrangements, a greater number of companies are considering the advisability of employing personnel counselors. They have not overlooked the general dislike of "company welfare work" and "paternalism" but feel that when production is of such vital importance, management should be concerned with any matters which affect individual productivity. This point of view would seem to be well supported by recent studies of the social nature of industry and the effect of personal attitudes and environment upon an individual's success on the job.[1] Women new to industry and faced with many difficult adjustments are not likely to resent a chance to discuss their problems with someone who understands both the requirements of the job and the pressure of home responsibilities.

B. In-Company Training

A good training program is equally applicable to men and women, and the degree to which a company's training is applied to women depends primarily on the extent and variety of their work. As women have begun to be placed on work usually done by men and transferred and upgraded along with men, the following methods of training have been used.

1. *Preliminary class-room training*

When any part of the instruction can be given satisfactorily to groups, or where preliminary technical training is required before the employee is assigned to regular work, class-room instruction has been found to be an efficient procedure. Class-room training is being used both in training new employees and in retraining men and women who are being transferred from non-defense to defense work. Some of the types of work for which class-room instruction is used in training women are special assembly jobs, riveting, drilling, inspection, and blue print reading. In a number of communities where industries cooperate closely with vocational schools in the development of their courses to fit specific job requirements, the training offered in the schools takes the place of class-room instruction in the plant.

2. *Vestibule training*

Many training supervisors believe that the first instruction on the use of a machine is most efficient if the new employees are segregated where

[1] See especially: F. J. Roethlisberger and W. J. Dickson. *Management and the worker.* Harvard University Press. 1939.

they are not under the pressure of work in the regular department and where they can receive the full attention of an expert instructor. The machines used by the new employees may be in one corner of the regular department or in a separate room. The value of this separate training is that, since the employee is concentrating on learning and the instructor on teaching, the right way of doing the job is learned more quickly. Most frequently the instructors are men. However, a few companies have expressed the opinion that women new to industry may develop self-confidence and learn the job more quickly if their instructor is a woman, and these concerns are developing women job instructors just as rapidly as the expansion of women's employment requires.

3. *On-the-job training and follow-up*

If the employee has been trained in a learner's group under a special instructor, the foreman or his assistant or group leader may need only to observe the employee's work at intervals to see how she is progressing and assist her when necessary. If no vestibule training is given, then someone in the regular department must be responsible for teaching the new employee. While in most cases, the departmental vestibule school as well as the on-the-job training are under the general supervision of the foreman, the individual instruction is usually delegated to a group leader, a special instructor or an older employee.

Companies reporting on this point last November were divided as follows: Six expected the foreman to give most of the instruction to new women employees, twenty used group leaders or special instructors, and fourteen depended entirely upon more experienced workers. A number of companies use one or another of these methods depending upon the size of the department and the difficulty of the job. The larger companies with rapid expansion seem to have found the use of group leaders or special instructors the more efficient arrangement for training on the job. In some of the smaller companies, the foremen have taught all the first women employees, and then as they have seen how the women progressed on the various types of work, have delegated the instruction to assistant foremen or experienced employees, depending on the complexity of the job. On simple assembly work, girls who have been on the job only a few months are now instructing other girls.

Whoever the immediate instructor, there is need for general coordination of on-the-job training to emphasize in particular the importance of knowing (1) that the worker is being taught the right way to do the job in her first instruction, and (2) that her work is carefully checked until she has reached normal efficiency.

C. Training for Upgrading

Company policies concerning the upgrading of women production employees have shown definite changes in the past few months. The evidence last fall was that women were employed principally for one specific job or could be transferred or promoted only within a very narrow range of jobs. Since then many companies have begun moving women into a much wider job area. The preparation for upgrading may be by learning on the job in a series of transfers, by understudy, by supplementary in-company training, and by outside courses. Learning through job progression is apparently the most frequently used system of upgrading, and is felt to be quite satisfactory when the change from one job to another involves only a little additional training. If entirely new skills or techniques are required, the employee is likely to need special training outside the workshop either in a company training department or in a vocational school.

A number of companies have expressed the opinion that vocational school courses are of most value in providing supplementary training for upgrading. They feel that progression through easily learned jobs in the plant plus outside study in skills required for advancement to new types of work will help the organization to use women most effectively at once and, at the same time, prepare for a much more extensive substitution as men are withdrawn for military service. There is now little questioning by industry of the capacity of women to learn the majority of skilled and semi-skilled jobs in many war industries. The extent of their upgrading would seem to depend on the supply of male labor, the length of the training period for any specific job, and the physical strength required. The following report of one company is typical of the experience of many:

> "In all of our plants women are now generally on machine tool operation. We have women operating hand screw machines, gear cutters, heavy and sensitive drill presses, punch presses, bench-lathes and even thread grinders. It is true most of these women are simply operators but our training activities are now beginning to pick out those who show a natural aptitude, with the idea that they will be trained at least partly to set up machines, to grind tools, and check the work! They are doing well —so well in fact that the other day the head of our tool room in one plant jokingly suggested that it might be well to select a few of them to become tool makers."

D. Training Women Supervisors

Upgrading of women production workers to first-line supervisory jobs, just as upgrading to more skilled work, has received a very

definite impetus since December. For the most part, however, little special training is given for prospective group leaders, job instructors, or assistant forewomen. The most common formal training is that for instructors given under the supervision of local Training-within-Industry representatives. A few companies have their own instructors' training course, and one of these reported that the first women assigned to the course made more rapid progress than the men and set new standards for the whole group.

Most of the comparatively few companies promoting women to higher supervisory positions—forewomen and assistant forewomen—are those which have employed a large percentage of women for many years. For the most part, the forewomen develop through gradual upgrading, but there are a few outstanding exceptions in training for women supervisors. In one company, young women college graduates are hired to be developed into supervisors. After six months' production experience, they are given instructors' training. If they prove to be good material for further upgrading, they are watched carefully by the personnel department and assigned a variety of jobs to acquaint them with all the processes in a department. Intelligent and outstanding women selected originally for production work are given the same opportunity for advancement.

This company's program for developing women supervisors attempts to meet the difficulties pointed out by the Women's Engineering Society of Great Britain. A past president of this organization mentioned the disadvantages of promotion from the ranks of women with inadequate background for leadership or of bringing in better educated women who knew little of industrial conditions. With the encouragement of this organization, special courses in foremanship for women were offered by technical institutes in England early in the war. The syllabus of one of these courses was followed with the comment:

> "Such a course is necessarily very condensed, and as regards the practical part must be regarded as a foundation on which more specialized knowledge can be built. It is not suggested that those who take it will be ready, on its completion, to fill responsible posts. In every case it should be supplemented by weeks or months of factory experience as an ordinary hand."[1]

A method used by a number of United States companies for training foremen for new plants was used for forewomen by one ordnance plant which employs principally women for production work. Experi-

[1] Holmes, Verena. "Women in the war industries." *Industrial Welfare and Personnel Management*, December, 1939. p. 453.

enced women operators were chosen for supervisory positions before the plant was opened and sent to study similar production work in an arsenal. Additional women supervisors have been trained under this key group. This company reported concerning its women supervisors:

> "Our classifications of foreladies are as follows, the figures given being for each shift: one shift department forelady, two shift division foreladies, four shift section foreladies and eight shift group foreladies. The shift group foreladies are used more or less as instructors. Since we have 220 sewing machines you will note that we are using one instructor for approximately every thirty machines. In placing new employees we try to divide the inexperienced operators among the experienced operators in such a way that each instructor will have approximately the same number of new employees.
>
> "On starting our project here we selected a few, approximately twelve, experienced operators whom we sent to . . . Arsenal for training in the manufacture of bags. Upon completion of this training these girls returned to the plant here and undertook the instruction of operators for our production lines. We have selected the balance of our foreladies from those women who showed particular aptitude or leadership."

There is infrequent mention of regular supervisory conferences which are important to the continuous training of both men and women supervisors. The need of such conferences was emphasized by one young woman supervisor who stated that she felt they would have been a great help to her in learning the responsibilities of supervisory work, in absorbing the practical knowledge of older supervisors, and in acquainting her in more detail with management's policies and aims.

E. Training for Technical and Personnel Jobs

Any special consideration of and planning for the training of women for technical and personnel jobs seem to have lagged behind the increasing employment of women for such positions. With the expansion of defense industries in 1940 and the greater employment of women in straight production work, an increasing number of companies began selecting women for personnel or employment managers or assistants, personnel advisers, and for such technical jobs as drafting and more advanced engineering work, laboratory technicians, pharmacists, and chemists. Training for these jobs was undertaken principally on the individual's initiative with little encouragement from colleges or industry.

Late in 1941, a few institutions were opening defense courses in engineering and personnel subjects to women, and a very definite trend in this direction is now apparent. Technical institutes in particular

are offering a variety of short introductory engineering courses, and companies are expecting to employ the women who finish this work satisfactorily. Only in a few cases, however, is there as close cooperation between industry and the colleges or technical institutes in the training of women as there is frequently between companies and the local vocational high school. The technical schools and liberal arts colleges have shown an eagerness to be of as much help as possible in preparing women for responsible positions in war industries. Their chief problem is how to know what training will be of most value to the individual student and the war industries. It has been suggested that two steps might speed up the training and help to use most efficiently the specially trained and educated woman in war industries: (1) inquiry by the United States Employment Service of estimates for future need of workers of this type as well as of straight production workers; and (2) local industrial committees, whose opinions and recommendations could be coordinated and summarized by a regional or national committee and made available to all colleges undertaking special training for war industries.

Early in the war, certain professional organizations in England foresaw the need for trained women in technical and personnel jobs and provided the motivating force toward the establishment of special courses. The Women's Engineering Society persisted, in spite of many difficulties, in its aim to develop training for women in work shop and engineering skills, and women are now being trained in a great variety of skills in many training schools and government training centers, although there is apparently a continuing resistance to the training of women for professional engineering jobs. The following points have been mentioned in connection with the British training under government auspices:

"1. A standard scale of allowance for training.
2. Women's dependents' allowances.
3. Men and women trained together for identical processes.
4. No age limit, but ability to stand war-strain."[1]

In 1940 a plan for an intensive training scheme for welfare and personnel officers was presented to the Minister of Labour by the Industrial Welfare Society and the Institute of Labour Management in consultation with the Joint University Council for Social Studies, and three months' courses were soon offered by four universities. The Ministry of Labour agreed to pay tuition fees and a maintenance allowance for the students. Final selection for the courses is made by

[1] "Women in industry," *Labour Management* (London), March, 1941. p. 30.

a Selection Board, appointed by the Minister of Labour. The report of a graduate of one of the first of these courses (a class of twenty-five women and five men) concluded:

> "The whole course was designed, and has, I think succeeded, in giving the future labour managers the minimum historical background required, in imparting the essentials of technical knowledge, in setting a high standard of work, and in giving some idea of the practical difficulties involved in reaching that standard."[1]

British personnel societies were perhaps in a better position to recommend the specific curriculum for training for personnel work because of careful study of this subject before the war. A Committee of the Institute of Labour Management appointed in 1937 reported in 1939 on the question of training women for labor management or industrial welfare work from all aspects: employer requirements, essential subjects for study, interviewing boards, and practical work during the period of instruction. Although a number of universities and colleges in the United States have good personnel training courses, there is no comparable development of training standards by a personnel association in this country. The availability of such recommendations would undoubtedly be of considerable help to colleges just inaugurating short courses for industrial supervisors and personnel workers in war industries.

[1] O'Donovan, Brigid. "Training for personnel management," *Industrial Welfare and Personnel Management*, April, 1941. p. 80.

IV. HOURS OF WORK

THE problems of hours of work for women industrial employees have been magnified since our entrance into the war, and questions as to optimum daily and weekly hours and the most satisfactory shift schedules for women as well as men are now facing almost all companies in war production. More than two-thirds of the companies surveyed in October and November were on an 8-hour day and 40-hour week for their women employees. Now only one-third are on such a schedule, and most of the rest of this group and others from whom new information has been received are on schedules ranging from 41 to 48 a week, with a few going above 50. Moreover, many more companies are now using women on the second and third shifts.

A. Relaxation of Legal Restrictions

The most frequently mentioned deterrent to second and third shifts for women last November was restrictive legislation. Immediately after the United States' entry into the war, exemptions from certain restrictions began to be made for any company that could show that the hours' laws interfered with its effective defense production. Some state hours' laws made provision for such exemptions, but in other states the emergency powers of the governor were the basis for announcements that upon individual application defense companies would be permitted to employ women longer hours or during restricted hours. Such an announcement usually was made after consultation with labor groups.

In a few cases, there has been considerable opposition to any extensive relaxation of hours' laws. In California, where the Industrial Commissioner has permitted the employment of women between 11 P.M. and 6 A.M. only at the penalty rate of time and a half, the unions have opposed any modification of this order, claiming that there were still plenty of unemployed men to be put on the night shift.[1] Increased accident hazard and serious fatigue were cited against relaxation of women's hours regulations in Ohio, but the number of unemployed women was given most emphasis at a hearing on the subject.[2] Lack

[1] *Iron Age*, February 12, 1942. p. 80.
[2] *Dayton Union News*, February 4, 1942. p. 5.

of information as to the effects of long hours, availability of unemployed workers, and the ill effect of postponing essential training of additional workers were mentioned by the Illinois State Federation of Labor in opposing the relaxation of standards.[1] An official connected with hours' exemptions in another state agreed that these conditions sometimes existed, but pointed out how difficult it was to require a small employer to hire and train enough workers for a second or third shift when he was not sure of any war order other than the one he was then trying hard to get out on schedule. However, in such a case, dispensation may be made only for a short period and if the request is repeated, the employer is urged to hire and train more workers just as quickly as possible.

As state legislatures are holding their regular sessions or being called into special session, the emergency provision for exemptions to hours' laws is generally being given exact legislative definition. These emergency laws for the most part are applicable to war industries only, permit exemption only upon application and after investigation by the labor or industrial commissioner or a special committee, and limit the extent of relaxation even in defense industries. For example, "The New York State War Emergency Act" sets up the following standards and limits:

> "(a) In no case shall there be dispensation from any of the existing peace-time restrictions of hours of labor or types of labor for minors under the age of eighteen.
>
> "(b) In no case shall any dispensation from the requirements of law be permitted for a period in excess of six months; unless reconsideration of all the facts and circumstances of the particular case warrants continuance of a dispensation.
>
> "(c) No dispensation from law may be given which does not safeguard health and welfare of the worker and which is not demanded by the necessities of adjusting state policy to national war-time requirements.
>
> "(d) No dispensation under this article shall be granted to any employer outside of war work.
>
> "(e) No dispensation under this article shall be granted to any employer in war work who can by utilization of available labor supply or by organizational or other reasonable adjustments, maintain maximum efficiency and production without sacrifice of existing peace-time labor standards.
>
> "(f) No dispensation may be granted under this article, except where necessary to prevent the peace-time restrictions of law from interfering with the paramount duty of maximum possible production in war work.

[1] *Illinois State Federation of Labor Weekly News Letter,* April 1, 1942. p. 1.

"(g) The industrial commissioner may, after hearing upon due notice, revoke dispensations not necessary to maintain maximum possible production in war work."[1]

In communities where there is still an ample supply of female workers, the chief problem at present seems to be one of planning, hiring and training in order to avoid inefficient and fatiguing hours for some women while others are unable to find employment. As the labor market becomes tighter, exemptions may have to be renewed throughout the emergency period. The effect of this temporary relaxation of normal hours' standards will depend both upon a careful check by state agencies to insure adherence to minimum standards and upon the additional efforts of industry itself to maintain good working conditions and to keep hours as much as possible at a healthful and efficient level.

B. Shift Schedules

1. *The single shift*

Almost all of the single shift schedules have a starting time of from 7 A.M. to 8 A.M. with an 8-hour day. Time over 40 hours per week is usually secured through work on the sixth day. One company reporting an 11-hour shift schedule for men beginning at 6:30 A.M. had set the women's beginning hour for the same time. The schedule for women provided for a 48-minute lunch period and for varied closing hours—from 3:18 to 5:18 P.M.—depending on the type of work and the demand for the items on which the women were working. This company felt that its employees preferred some daily overtime on a five-day week rather than Saturday work.

2. *Two-shift schedules*

A great variety of schedules have been reported for two shifts per day. They are arranged on a basis of a five, five-and-a-half, or a six-day week. The beginning hour of the first shift varies from 6 to 8 A.M., and the beginning hour for the second shift from 1:30 to 4 P.M. The only schedules reported by more than two companies were a 6 A.M. to 2 P.M. and 2 P.M. to 10 P.M. arrangement under which the employees are allowed a 15 or 20 minute lunch period on company time; and a 7 A.M. to 3:30 P.M. and 3:30 P.M. to midnight schedule which allows for a 30-minute lunch period on the employee's time. This latter arrangement is for a 5-day, 40-hour week, with the same schedule for Saturday to make a 48-hour week when production schedules require overtime.

[1] New York State Laws, Chapter 445, Laws of 1942, as amended by Chapter 544. Section 81.

A number of companies have reported that women employees show considerably better attendance on a 5- or 5½-day week than on a 6-day week, since the former gives more weekday hours for shopping and household chores. The following is an example of a schedule for a 5½-day week, totalling 46 hours:

Schedule A

Mon.-Fri.	1st shift	6 A.M.-2:30 P.M.—30 min.	lunch	period
	2nd "	2:30 -11 P.M.— "	"	"	"
Saturday	1st "	6 A.M.-12 Noon—10 min.	rest	period
	2nd "	12 - 6 P.M.— "	"	"	"

Non-alternating shifts

The chief advantages of this schedule are that it allows for flexibility from a 40 to a 46-hour week, but in any case gives a good week-end to both shifts. The chief disadvantage is the 6 A.M. start of the first shift, a time that is not liked by anyone and particularly disliked by women who have a long distance to travel between home and work.

British studies of hours of work in the last war and since then have shown the superiority of two day shifts over one long day shift or a day and night shift. H. M. Vernon says in regard to the two-shift system for women:

> "The need for a very large production of munitions may require the plant of munition factories to be kept running for longer than the legal maximum of 54 hours a week permitted for women, but the evidence to be adduced shows that it can seldom be so great as to necessitate night-shifts for women and young persons. This is because an intermediate stage of shift-work exists which avoids the evils of night work. It is the two-shift system, according to which women and young persons are permitted to work for two 7½-hour day-shifts, between the hours of 6 a.m. and 10 p.m. . . .
>
> "The two shifts usually run from 6 a.m. to 2 p.m. (with a meal break of half an hour at 9 a.m.), and from 2 p.m. to 10 p.m. (with a meal break at 5:30 p.m.). As the morning shift work for six mornings a week their total hours come to 45, but the afternoon shift have no work on Saturdays, and put in only 37½ hours.... The workers, who change shift every week, therefore average 41½ hours or 40¼ hours, and owing to the great saving in overhead costs, it has usually been found possible to pay them the same wage as for the usual 47 or 48 hours."[1]

[1] Vernon, H. M. *The health and efficiency of munition workers.* London. Oxford University Press. 1940. pp. 54-56.

In concluding this section, he stated:

> "In many and probably in most cases, therefore, *there is no real justification for compelling women to work on night-shifts in order to obtain a maximum output of munitions.*"[1]

Recommendations of this nature and the tighter labor market in England have made the two-shift system (either a two-day shift or a day-and-night shift) much more frequently used than the three-shift system. Except for a brief interlude of long hours after Dunkirk, the hours of women and young people have been controlled by a General Emergency Order granting individual factories permission to work exceptional hours after investigation. The Annual Report of the Chief Inspector of Factories for the year 1940 states:

> "At the end of the year a return was made by the Inspectors in regard to the 'permissions' to operate under the General Emergency Order which they had given. This gives a fair picture of the hours during which women and young persons over 16 were employed in munitions or other important work during the latter part of the year. Out of a total of 5,493 factories holding such permissions, in only 171 was a system of three shifts asked for, and in only 282 a system of two short day shifts. In the remainder, either a single day shift or a system of day and night shifts was allowed and the total weekly hours varied between 48 and 54 in 1,585 of these factories. In 1,027 the total was either 55 or 56 and in 2,428 it was over 56, but did not, of course, exceed 60."[2]

Two factors in the United States—a very substantial opinion that optimum weekly hours for women are 40 and that they become uneconomic beyond 48,[3] and seemingly adequate reserves of women workers—have influenced the hours' policies here towards a three-shift system with shorter daily and weekly hours than in England.

3. *Three-shift schedules*

The number of companies using women on a three-shift schedule has increased greatly since December and indications are that this practice will become more frequent as companies get their plants fully adjusted to war production and women replace men more extensively. As mentioned above, legal restrictions are for the most part now relaxed to permit women to be placed on night work, and apparently governmental agencies, whenever practicable, encourage sufficient additional

[1] *Ibid.* p. 59.

[2] *Annual report of the chief inspector of factories for the year 1940.* H. M. Stationery Office. 1941. p. 20.

[3] See Industrial Relations Section, Princeton University, *Optimum hours of work in war production.* 1942.

hiring of women to fill a third shift rather than grant permits for excessively long daily hours. There has been no evidence of trade union objection to night work for women except in California.

The hours worked by women under the three-shift system are 7 or 8 per day, depending on the length of the lunch period and any interval between shifts, and 40 to 48 a week. The starting hour of the first shift varies from 6 to 8 A.M., but the schedule reported most often is 7 A.M. to 3 P.M., 3 to 11 P.M., and 11 P.M. to 7 A.M. The companies using this schedule feel that the 7 A.M. and 11 P.M. changes of shifts fit in better with normal living schedules than the 6 A.M. change if an earlier start is made, or a change at midnight if the first shift is scheduled for 8 A.M.

With only the same number of crews as shifts under these three-shift arrangements, the machines operated by the women are inactive from 24 to 48 hours a week. To get more machine hours without causing any of the women to work excessively long hours requires the hiring of an additional crew. Many of the 168-hour-week schedules for men use a "swing" or relief crew to give each of the other crews one or two days off each week. A swing crew with continually changing times of work is felt to be a very unsatisfactory arrangement for women. A more acceptable arrangement in the use of a regular fourth crew is reported by a British journal.[1] This scheme provides for six days on each shift and two days off, with an average weekly work period of 42 hours. Schedule B indicates how this would work out on a 24-week cycle.

Schedule B

	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
7-3	A	A	A	A	A	A	D	D	D	D	D	D	C	C	C	C	C	C	B	B	B
3-11	C	C	B	B	B	B	B	B	A	A	A	A	A	A	D	D	D	D	D	D	C
11-7	D	D	D	D	C	C	C	C	C	C	B	B	B	B	B	B	A	A	A	A	A
off	B	B	C	C	D	D	A	A	B	B	C	C	D	D	A	A	B	B	C	C	D

The advantages of this scheme are: (1) maximum hours of machine operation; (2) with 30-minute lunch periods, the weekly hours actually worked by each employee would average slightly under 40; (3) the regular forward shift changes always occur after a two-day rest; and (4) there is no need for part-time work. The chief disadvantage, of course, is that it involves four persons per machine as against three on a six-day schedule with three crews each working 48 hours. This disad-

[1] *Industrial Welfare and Personnel Management,* February, 1941. "Hours of work." pp. 27-29.

vantage in the United States is not serious, but involves the time for training the additional crew. In the great majority of jobs on which women are employed this is short.

If war production schedules require the full-time operation of machines on which women are working, shift schedules such as the above, or employment of part-time workers, or both, may be essential. The part-time work of certain groups of women can facilitate the arrangement of shift schedules requiring individuals to work no more than 40 hours a week and will also help to bring into the labor market women who cannot undertake even a 40-hour week job. The British are seriously considering the greater use of part-time workers.[1] American companies may also find schedules including part-time work an important means of using the local labor supply most efficiently.

4. *Problems involved in scheduling women for second and third shifts*

a. Rotation versus non-rotation

As more and more companies are finding it necessary to build up three or four crews for full-time machine operation, the question of rotating or non-rotating shifts becomes more important. Even with a considerable bonus for the third shift, it is hard to find enough women who like or can stand continuous night work. A few companies have reported that many women prefer the night shift to the late afternoon shift, since, if they are married it gives them a chance to be with their families and get the housework done during the day, and if they are single, it lets them have evening engagements before work. The serious difficulty in this arrangement is that girls and women who try to keep up an approximately normal day-time schedule and work at night soon break down. One company attributed a considerable part of its high labor turnover among married women to this factor.

Firms which are on a non-rotating basis point out that this permits a regular adjustment of living arrangements and that, after a short period, most individuals can adjust their rest and waking periods to a routine, whatever the hours. Especially is this so if the individuals who prefer night work gradually fill up the third shift. This is undoubtedly the ideal condition but is not likely to be reached under ordinary conditions and even less likely under conditions of rapid expansion, or where shift assignments are made according to seniority. Neither management nor the union wants to risk the dissatisfaction of longer-service employ-

[1] *The Economist* (London), March 28, 1942. "Part-time workers," p. 422; April 4, 1942. "The woman shortage," pp. 460-461; and *Employment of women—suggestions to employers.* p. 4.

ees by permitting a new employee to be changed to the most preferred shift because she finds she cannot sleep during the day or that her children need her when they are home from school. One employer suggested that the non-rotating shifts might increase labor turnover by weeding out the women who could not stand night work but felt that the majority of his employees preferred it to the continual readjustment to rotating shifts. Rotation was considered particularly difficult for mothers who had to make arrangements to have young children looked after.

The chief advantages pointed out for rotation are that it divides the inconveniences and benefits of each shift equally among all the workers and avoids the grievances connected with permanent shift assignments. One company mentioned that it permitted normal social life—which was of great importance to the young girls—at least one-third of the time, and that the encouragement of group recreational activities had developed a lively competitive interest between the workers of the different shifts. Authorities on industrial health agree that night work is bad, and feel that if women must be used on 24-hour operations, some kind of a rotating schedule is likely to be best for the group as a whole. They have, however, expressed differences of opinion as to the length of the rotation cycle.

b. The cycle of rotation

As a result of his work with the British Health of Munition Workers Committee, H. M. Vernon[1] feels that, if night work is necessary, rotating shifts weekly is the best arrangement. He considers it unlikely that munition workers could ever reverse the normal daily rhythm of activity and rest, and, therefore, the night work period should be short in order to prevent serious accumulation of fatigue. He states:

> "The Committee came to the conclusion that the evidence, taken as a whole, showed that discontinuous night work in women gives an output which usually approximates to that obtained by day. . . .
>
> "The health of the women was not specially studied, but some indication of it is afforded by the extent of their absenteeism. It appeared that the timekeeping of girls aged 14 to 18 was practically the same whether they were working on permanent day-shifts or on alternate day- and night-shifts, whilst that of women aged 19 and upwards was actually somewhat better when on alternate day-and night-shifts than when on permanent day-shifts."[2]

[1] Vernon, H. M. *The health and efficiency of munition workers.* 1940. pp. 45-59.
[2] *Ibid.* p. 52.

On the other hand, a British industrial physician recommends a 4- to 6-week period for each shift:

> "We must add that our own observation leads us to the conclusion that short shift changes produce fatigue conditions among workers engaged on both the night and day shifts. . . . On the basis of experience we may venture the opinion that no night-shift period should exceed 4-6 weeks unless adequate measures are taken to ensure that only those who are suited for night work and who are living under satisfactory conditions shall be employed, and a very careful watch for the first signs of the onset of industrial fatigue is instituted."[1]

The conclusions of one study of this subject in the United States recommend even longer shift cycles than the above, and suggest that the rotation be once in several months.[2] The information secured from companies, however, shows a distinct preference for one- or two-week periods on each shift. One company with weekly rotation in all its plants found it satisfactory to the large majority of employees, although it recognized the fact that with an increasing percentage of women in some plants there were new problems. Another company has tried both non-rotation and various cycles in rotation and has settled upon a two-week period for each shift as being most acceptable to employees and supervisors.

Whatever the rotation cycle, companies and scientific observers have emphasized that shift changes should always move forward and that there should be an interval of *at least* one full day between shift changes.

c. Early morning and late night changes

Employers recognize the inconvenience and some hazard to women employees reporting for work as early as 6 A.M. and others coming to work or leaving at midnight. Most companies make an effort to have the streets and bus and railroad stations near the plant patrolled carefully at time of change of shifts. Many executives seemed to feel that the danger of molestation was magnified by women when first put on an early or late shift, and that after a few weeks they lost this fear. The chief prob-

[1] Collier, Howard E. *Outlines of industrial medical practice.* Baltimore. Williams & Wilkins Co. 1941, p. 151.

For a further discussion of these differing points of view, see articles on night work in *Industrial Welfare and Personnel Management* for October, November, and December, 1939.

[2] Kleitman, Nathaniel. *Sleep and wakefulness.* Chicago. University of Chicago Press. 1939. 638 pp.

Dr. Kleitman's recommendations on the multiple shift problem will soon be available in a booklet to be issued by the Division of Labor Standards of the United States Department of Labor.

lem is the infrequency of bus or train service between midnight and 6 A.M. Companies have usually found the transit service cooperative in rearranging local schedules when a considerable number of passengers are concerned. However, where workers are living in a nearby community, the interurban bus service cannot be readjusted for a few commuters. In several companies, where women workers had been recruited in nearby towns, the unsatisfactory night and early morning bus service was considered one reason for difficulty in securing enough workers and for the high labor turnover. The remedies suggested for such a situation have been a local dormitory for women, concentrated hiring from certain areas with provision for special bus service to those sections, and refusal to employ individuals from outlying areas who would have difficulty in night transportation. As the labor market becomes tighter and it becomes important to employ women who live in out-of-the-way locations, special preference in shift assignment may have to be given them.

C. Lunch and Rest Periods

Lunch periods for women industrial employees vary in length from 15 minutes to one hour. A 30-minute period was allowed by approximately one-half of the companies reporting last November, and was considered the satisfactory minimum by all. However, the schedules of one-fifth of the entire group allowed only 15 or 20 minutes for lunch. In practically all cases, the 15 or 20 minutes was part of an 8-hour shift and time out for eating was paid for by the company. As the three-shift schedule becomes more widely used, more workers are on such a shortened lunch period. The fact that only a few of the companies having a lunch period of 20 minutes or less have plant cafeterias or lunch carts in the plant means that employees must bring their lunches and eat at their work place. One executive's comment was, "This bothers us. We know it is not a good arrangement." Another company beginning to use women on a third shift reported that they planned to keep to a 30-minute lunch period on all shifts, since they felt anything less than this would result in inadequate lunches and lowered vitality of the workers.

Many state laws require a 30-minute to an hour's rest after a certain work spell (usually 4½ to 6 hours). Some of these provisions are now being relaxed to permit a 30-minute lunch period but, thus far, only one state is considering exemptions to permit less than 30 minutes for a meal break. Scientific studies of industrial fatigue and the opinion of many executives raise doubts as to the wisdom of such a move. A recent report of a survey of the diet of workers in a West Coast aircraft plant stated: "In shifts of 25,000 half an hour is given for lunch, and by the time

these people find a place to eat they have only 10 minutes for the meal."[1] When no more than 20 minutes is allowed, workers must eat even more hurriedly. An adequate rest pause in the middle of the day's work and time to eat a nourishing meal are both vitally important factors in sustaining the workers' health and productivity, and are matters which seem to have been given too little consideration by many expanding war industries.

The need of regular rest pauses morning and afternoon would seem to be increased as the lunch period is shortened. And yet, judging from the returns from the companies included in this survey, regular rest pauses are infrequent in American industry and, as shift schedules have shortened lunch periods, no more thought has been given to the need for them. A study of rest pauses in British industries in 1939 showed that there had been a steady growth in provision for official rest pauses as distinct from unofficial pauses taken individually.[2] Employer opinion as to comparative effects of official and unofficial pauses showed that 91.6 per cent of the companies with official (rota) pauses had experienced good effects as compared to 63.2 per cent reporting good effects from unofficial rests.[3] Earlier studies of the British Industrial Fatigue Research Board "showed that in the great majority of cases the introduction of a rest led to an appreciable improvement of output, in spite of loss of working time."[4]

Only one-fifth of the American companies from whom information was secured have a regular rest period for all women production workers. About the same number have regular rests for women on continuous operation jobs or other work which requires steady and close attention. Other companies allow rest pauses as the work permits and the individual desires. One employer said that morning and afternoon rests probably ranged from 5 to 15 minutes per individual, and that often the employee had some refreshment at that time. Canteens, milk bars, and soft drink dispensers are an accepted part of the equipment in many factories. One supervisor, commenting on a box of empty bottles said they were a nuisance, but added that the employees liked the refreshments so much that "there would be deuce to pay if you tried taking away the machines."

By and large, American employers seem to agree with British opinion that "rest pauses and especially snack-pauses are physiologically desira-

[1] Quoted in the *Business Week*, April 18, 1942. p. 73.

[2] Ramsay, J., Rawson, R. E., and others. *Rest pauses and refreshments in industry.* London. National Institute of Industrial Psychology. 1939.

[3] *Ibid.* p. 33.

[4] Vernon, H. M. *The health and efficiency of munition workers.* pp. 36-37.

ble."[1] There is apparent need, however, for a much wider use of official rest pauses and a study of the length of rest periods for women workers under various hours of work and production standards and tempo.

D. Annual Vacations and Leaves of Absence

A considerable majority of the companies surveyed in this study have an established vacation plan which provides some days off with pay to all employees who meet the minimum service requirement. The question raised last year and again this is whether the pressure of war production should interfere with vacations. Companies, for the most part, express a desire to give vacations wherever possible. Several executives have mentioned particularly the value of giving a few days off this summer to women who have been employed since January 1st. They feel that this will break the monotony of their work, build up good will for the company, and, in the long run, result in improved productivity.

The matter of leaves of absence for women war workers has not yet come to the fore in the United States. Our industries will undoubtedly soon face the same problem that Britain has met for some time—the need for leaves of absence for wives of men in the service when their husbands are home on leave. This is given official recognition in the leaflet on "The Employment of Women."

> "It must be remembered also that many women workers will have husbands in the Forces coming home on leave periodically. It is suggested that those women should be told at the time of their engagement that, apart from an emergency, they will be given reasonable leave of absence on those occasions."[2]

A recent comment on the amount of time granted urged a more generous policy:

> ". . . the concession which provides for a maximum of fourteen days for wives of men serving at home and a minimum of fourteen days for wives of men on leave from overseas—in each case without pay—is not generous enough. These women should be guaranteed holidays whenever their husbands are on leave, one week of which should rank as their normal holiday. Men serving at home are not likely to get less than twenty-eight days a year. It must be realised that there is a very definite upper limit to the output which can be extracted from any worker. Many women put in a good day's work outside factory hours, even in homes from which husbands are absent. War production is likely actually to

[1] Collier, H. E. *Outlines of industrial medical practice.* 1941. p. 146.

[2] *Employment of women—suggestions to employers.* Ministry of Labour and National Service. March 24, 1941. p. 4.

profit from a generous leave policy. But this should not be left to the discretion of the individual employer."[1]

Maternity leave of absence is another question likely to arise as more married women enter industry. Only two of the companies in the survey reported such a policy. One grants maternity leave to women in one department in which skilled work is done by women after a year's training period. The other company has accepted the following clause in its labor agreement:

> "A one (1) year leave of absence shall be granted to pregnant female employees having one (1) full year or more of seniority. Seniority shall not accumulate during such leave. The employee must report back for actual work within one (1) year after date of taking such leave to retain previously established seniority."

E. Absenteeism and Labor Turnover

The experience of many companies has been that an increase in hours of work from 40 to 48 per week results in a higher absence rate for all employees, and, frequently, a considerably greater increase in the number of absences among women than among men. None of the companies on a 40-hour week and one shift reported any problem in absenteeism or excessively high turnover. The problem was cited by a number of companies on a 48-hour week, and was apparently most serious with those on a 6-day week and three-shift operation.

One company reported that the female absence rate increased markedly whenever hours went beyond 40 per week—and that absences were highest on Mondays and Fridays. Other companies mentioned bad absence rates for Monday, particularly among married women. The policy of a number of companies against hiring mothers of young children was the result of poor absence experience and many "quits" with this type of employee. By and large, the reasons given for the more frequent absences of women on a six-day week were family responsibilities rather than illness. There are, however, some indications that ill health is a factor. One company stated that absences due to colds had recently been high among women on the first shift (starting at 6 A.M.) and they felt this might be due to insufficient sleep. Several companies have thought their high number of quits among women on the night shift was due to physical exhaustion.

While little definite information is available regarding differences in American concerns between absence and turnover rates for men and

[1] *The Economist*, April 4, 1942. p. 461.

women in a work week of more than 48 hours, the opinion of a representative group of industrial executives is that hours beyond 48 would result in greater absenteeism and higher turnover because of lowered vitality, ill health, and pressure of home responsibilities. One executive, questioning the advisability of companies securing permission to work women beyond 8 hours per day and 48 per week, stated:

> "I have found that where we attempted to work women beyond 48 hours we soon lost any so-called advantages because women became apt to take days off on their own account so frequently as to cancel any imagined advantages from a longer working week."

The most exact information on comparative absence rates of men and women for varying hours and conditions of work is given in the reports of the British Industrial Fatigue Research Board. They show that women's absences increased both with an increase in hours and a heavier occupation.[1] A recent study of the Board states in summary:

> "Women lost more time than men, even when the type and conditions of work were fairly similar for both sexes, and for this home duties and family responsibilities were largely responsible. A substantial part of the total time lost by both men and women was due to sickness."[2]

A few suggestions for reducing absenteeism among women employees were made by executives with whom this question was discussed. They included: (1) more careful selection; (2) a visiting nurse; (3) special rest rooms to permit women to lie down during the day in case of slight illnesses; (4) better arrangements for care of young children; and (5) not more than a five- or five-and-a-half-day work week.

Longer hours in Great Britain along with air raids and blackouts have made this a much more severe problem there than here. Arrangements for care of children of working mothers and assistance in shopping have both been mentioned frequently by British employers as important aids in reducing lost time. Shorter hours and hours schedules which allow for a week-end of a day-and-a-half or two days have always brought about an improved attendance. A recent amendment to the Essential Work Order makes it an offense for workers to absent themselves from work or turn up late without reasonable excuse.[3] British personnel officers have, however, emphasized the importance of considering most absences

[1] Vernon, H. M. *The health and efficiency of munition workers.* p. 24.

[2] Medical Research Council, Industrial Health Research Board. *Hours of work, lost time, and labour wastage.* 1942. p. 11.

[3] *Ministry of Labour Gazette,* April, 1942. p. 82.

based on some justifiable reason and of helping the individual employee to remedy the specific difficulties causing the absence. In England, as here, high productivity is the goal and thoughtful observers point out the fact that absences and turnover are only symptoms of conditions which prevent optimum individual production.

V. WAGE RATES AND WAGE POLICIES

A. Wage Differentials

THE proportion of companies which reported a policy of "equal pay for equal work" in November suggests that this has not been a widely accepted standard in American industry. Only seventeen firms stated that they paid the rate for the job irrespective of the sex of the person filling the job. Moreover, in these companies, the average earnings of women were considerably lower than the average earnings of men, since women were employed only in the lower job classes. Other companies mentioned a differential for men and women. The exact rates for men and women operators were given only in a few cases, and these show a wide variation as to differentials. One company stated that when girls were put on jobs held by boys until recently, the girls' beginning rate was set 5 cents lower, in order to keep the rate somewhat in line with other women's rates. Two companies reported a 10 per cent differential when women were placed on work previously done only by men. Other beginning hourly rates for men and women operators on jobs in the same classification show differentials of from 3 to 15 cents.

Many reasons were suggested for the differentials between men's and women's rates. A reason frequently mentioned, which is probably as determining a factor as any, is "the custom of the industry," or "the going rate in the community." Other reasons were: "The woman's job is never *exactly* the same as the man's . . . but jobs must be reclassified and reengineered in some respects when women replace men"; "Greater versatility is required of men"; "Women require more supervision"; and "Turnover is higher." One industrial relations executive stated what is undoubtedly an important factor, "The differential is based on masculine prestige as much as on productivity." A few companies told of substituting women on jobs at a lower rate than the men had been getting because competitive conditions made it necessary to reduce costs. Their experience and that of many other companies has been that women can be used on many jobs, sometimes even at the same rate of pay, to reduce the unit production cost. One executive weighing all these reasons concluded that the differential was based primarily on supply and demand, and that women's rates in war industries would soon have to be the same as men's.

Many other executives citing the above reasons for differentials last fall felt that the differentials might be reduced or abolished if war conditions greatly increased the demands for women industrial workers. They recognized also that union attitudes would be influential. Both factors—the increased need for women in industry, and union demands—are now having the foreseen effect, and rate differentials are being lowered or are disappearing in war production work. This adjustment is, however, not always an easy one. Women with long service working at the woman's rate resent younger, less experienced women replacing men in the plant and beginning at the man's higher rate.

England has tried various solutions for the problems created by long-established wage differentials. Early in the war, a number of agreements were negotiated in important industries accepting the principle of equal rates where women replace men. Perhaps the most important of these was an agreement in the engineering industry "to provide for the temporary relaxation of existing customs so as to permit, for the period of the war, the extended employment of women."[1] It specified that women drafted into industry under the provisions of the agreement should be regarded as temporarily employed and that a record should be kept of all such changes. It also established a system whereby, after a probationery period of 8 weeks, the rate of women shall gradually be increased until those "who are able to carry out the work of the men they replace without additional supervision or assistance shall, at the end of the 32 weeks, receive the basic rate and national bonus appropriate to the men they replace." The agreement, however, specifically mentions that it does not affect the employment of women workers engaged on work commonly performed by women nor to the extension of their employment to work hitherto performed by youths under 21 years of age.

Statements concerning the general policy for wage rates in England report that negotiated rates for women are similar but not always equal to men's rates. The report of one American observer[2] was:

> "In general it may be said in England that where women do work similar to men with the same amount of supervision, the women receive the same wage as men. However, when additional supervision is necessary, women are paid about 80% of the normal rate for men."

The following excerpts from two articles in *Labour Management* show

[1] *Ministry of Labour Gazette,* June, 1940. p. 159. This gives the full text of the agreement.

[2] Hambrook, R. W. *Utilization of female help in aircraft plants in Great Britain.* Aeronautical Chamber of Commerce of America. Information Bulletin No. 1. Jan. 3, 1942, p. 9.

an acceptance of the principle of equal pay on jobs in which women are replacing men and the difficulties involved in maintaining previously accepted differentials:

> "The majority of employers here in Great Britain have no desire to seize the present opportunity to reduce their labour costs in this particular, and have readily accepted the economic policy of paying the 'rate for the job.' This involves, as a corollary, that where the full job is not done by a woman, only a proportion of the man's rate shall be paid. While this policy may have important and far-reaching effects after the war upon the relative positions of men and women and upon the relative demands for their labour, it is right and proper at the present time."[1]

> "These Agreements [that women replacing men shall be paid men's rates] by no means dispose of the wage difficulties from the women's point of view. Up to the present few women have been earning men's wages, as the Agreements provide for a probationary period of 32 weeks, during which the women on men's jobs work up gradually from women's wages. . . . In practice women frequently do not get men's full rates, for if they do not do the whole of the work formerly done by men, and if the jobs have been altered (because of the installation of new machinery for example) the rates have to be specially negotiated. But the women who have had some training are going to be considerably less aggrieved than those who have always been in war industries and are still on women's jobs at women's rates, and also than those who have been transferred from the luxury trades to women's jobs in engineering trades. The difference between men's and women's rates is so great that the former who see girls, sometimes less skilled than themselves, earning 74/—will resent earning 43/—, and the latter will almost certainly earn lower wages than previously, as during the last ten years the luxury industries have been the most prosperous, and have been able to pay higher wages than the war industries."[2]

The previous acceptance by some American concerns of the policy of equality of pay, and the generally lower differential than in England makes the problem somewhat less severe in this country. A practical solution through the policy of promotion to the higher paid jobs was suggested by one executive:

> "Up to the present time there has been little change in the portion of

[1] Northcott, C. H., "Wage policies in war-time." *Labour Management,* June, 1941. p. 80.

[2] Gauntlett, Pamela J., "A survey of the problems of the employment of women in war-time." *Labour Management,* February, 1942. p. 24.

women employees in our various factories, but we are now proposing to train women for work which has always been considered men's work, and while this creates many problems, the most important is that relating to rates of pay.

"We expect to pay women on these jobs the same starting rates, piece rates, or day-rate based on output as we are paying the men. However, if extra services are involved, these will be included in determining the rate of the women. In other words, we are going to pay the same cost per piece for work which is done by women as we are paying to the men.

"This does not have any bearing on jobs which have always been considered women's work, as we expect to continue to employ women on these jobs on the same basis as in the past.

"We will probably be confronted with the problem of transferring women now engaged in the factories to the new jobs which are going to pay more money and retrain new women for the existing jobs."

Other companies are gradually abolishing the differentials on all jobs. One company, for example, reported that:

"The problem of wage differentials has been pretty thoroughly solved except in one or two divisions. In those divisions, by agreement with the union or employee association, wage differentials have been in effect for some time. They are gradually being removed and in most divisions there is no such differential. In . . . , we do not indicate on our wage schedules whether the work is to be performed by a man or a woman."

The trend in war industries appears to be definitely towards the abolishing of wage differentials based on sex. This would seem to be not only the result of union pressure, but also because companies consider it an important factor in getting more women into the labor market.

It is an interesting fact that on this question of equal pay the attitude of the male membership of a union sometimes varies considerably from that of the union leaders. A number of companies reported that, even when the union had demanded the same rates for women, the men resented the adoption of this policy. A small company, for example, discussed the introduction of women with the union officers and stated that they would be paid at the same rates as men, that is, on a piece-rate basis. The union agreed, although there were complaints from the rank and file that the women should not be started at the same learner's rate since they would probably take longer to learn the jobs. After three months' experience with women co-workers, the complaint is on a different basis. The women take no longer to learn the jobs and in a few cases are earning a higher bonus than any of the men ever earned.

B. Wage Incentives

The question of increased earnings for women through a faster production pace is looked at from different points of view by companies and unions. One company executive wrote:

> "As to pressures to lower wage differentials . . . locally we hear nothing of it. The average piece worker seems to be able to increase her earnings without an increase in rate almost any time when the group idea of what they want to earn steps itself up. Our women have increased their earnings 10% to 20% this way. Part of it is due to the steady flow of work of the same kind, but the principal part is the raising of the social standard of what 'normal' earnings ought to be and finding that the company does not cut the rates."

On the other hand, a trade union leader suggested that women set an excessively high pace in many jobs because they are likely to be employed only for a few years—when they are young and have the greatest physical vitality. The pace set by men, he felt, was one which they could continue at for a whole working lifetime. This same unionist commented:

> "One thought seems to be uppermost in my mind concerning women in industry, and one important question of the day should be whether the children of the future will suffer because of mothers undergoing physical hardships in wartime industries. The speed-up systems being introduced in industry will create a problem for us, unless something is done to prevent employers using influence and bringing pressure to bear upon time study 'experts.' . . . We must do something to prevent some of the inhumane speed-up systems being used in industry today. We must do it now—if we are to take a long-range point of view."

Other unionists and a few employers have also pointed out the necessity of considering present incentive wages from the point of view of the health of the worker as well as for immediate maximum production. Because of their comparative inexperience in industry, women may need encouragement toward steady production and attendance rather than toward spurts of high production which they can maintain only for a short time.

C. Payment for Overtime

Policies as to overtime rates vary little between men and women. No mention was made of overtime rates as a deterrent to the employment of women for more than 40 hours a week. The only situation in which over-

time appeared to be a factor in any way affecting the greater use of women was in California. A number of companies in that state reported that the ruling of the Industrial Commissioner requiring payment at the rate of time-and-a-half for all women employed between 11 P.M. and 6 A.M. had kept them from employing women on night work.

VI. HEALTH AND SAFETY

A. Accident Prevention

1. *General safety programs*

LITTLE information is available as to comparative accident rates for men and women production workers. Industrial relations executives and safety engineers, more often on the basis of a general knowledge of the accidents in the plant than on an analysis of accident statistics, express varying opinions as to comparative "accident-proneness." In a majority of cases the accident rate was said to be lower for women principally because women were placed on less hazardous jobs. A contrasting statement was that the company had "40% more accidents and sickness among women than among men employees." In any case, management frequently requires special attention to the safety instruction of women on the assumption that they have had no previous experience with machines. One executive stressed the point that the company was trying to secure a high grade of women applicants and could not afford, as a matter of good public relations, to have any serious accidents. The accident prevention program of this company includes: (1) an orientation course in which is presented the good safety record of the firm, the need for utmost care by every employee, and information on specific safety and clothing rules; (2) special attention to safety instruction in connection with on-the-job training; and (3) study by the safety engineer of any possible improvements in safety devices whenever women are placed on work previously done by men.

2. *Restrictions against lifting heavy objects*

Companies giving any information on the question of rules to prevent women lifting beyond their strength reported not only that they had such rules, but also told of definite arrangements to avoid as far as possible any lifting of materials by women employees. Conveyors, mechanical lifters, and long work tables which permit parts to be pushed along rather than lifted from one table to another all do away with the need for heavy lifting. When lifting of heavy boxes of supplies or completed parts is necessary, this work is done by porters or service men.

The maximum weights permitted to be lifted by women production

workers varied in this group of companies from 15 to 50 pounds. The 15-pound limit is incorporated in a labor agreement and the company's personnel executive said the women were quick to question any new work which involved lifting anything approaching that limit. Most American companies are apparently well above the legal and minimum health standards on this point. One concern reported, "The State law limits lifting to 75 pounds; we limit it to 30 pounds *under favorable conditions.*" Reports of the British Industrial Health Research Board and the United States Women's Bureau have pointed out the need of considering various factors in determining optimum loads for women and concluded that the most economical load is about 35 per cent of the body weight.[1]

Since women will be taking over many jobs previously handled only by men, companies may have to give new consideration to the question of healthful weight limits. In some cases, women who have done manual work for years may be able to lift considerably more than the 15, 25, or 30 pounds set by many companies. For new conditions and exceptional jobs, the maximum weight to be allowed may depend on the height to be lifted, distances to be carried, and bulk of the material in relation to the strength of the individual women assigned to the task.[2] An excellent policy reported by one company is, "Any job requiring lifting by a woman must be approved by the company physician."

3. *Clothing rules*

Of the 62 companies surveyed in late 1941, approximately one-half stated that they had some special clothing rules for women in factory work. The proportion has increased since then, and the trend is towards more definite clothing requirements as women are assigned to work that is dirtier, heavier, or more hazardous than ordinary women's work. The least stringent of the clothing rules call only for "sensible" dress, or forbid jewelry and long ties and wide sleeves, which might be caught in a machine, and require hair nets and low-heeled shoes. Other companies require women to wear a standard uniform. This may be slacks and shirt, overalls, smocks, or "Hoover" aprons.

The need for definite clothing rules was expressed by a number of executives in companies where such rules were not in force. Comments

[1] See: Industrial Health Research Board, Report 44. *The physique of women in industry.* By E. P. Cathcart and others. 1927; and United States Department of Labor, Women's Bureau. *Lifting heavy weights in defense industries.* Special Bulletin No. 2. 1941.

[2] For all the factors to be considered, see Special Bulletin No. 2 of the Women's Bureau.

applied particularly to shoes. One safety engineer said that most of the first-aid cases resulting from falls on staircases or on slippery floors were due to high-heeled shoes. Another said that management recommended flat-heeled shoes, particularly to women and girls whose work involved standing, but that old, high-heeled shoes were worn by many and undoubtedly added to the worker's fatigue and the accident risk. While the reported experience indicates that, if safety and efficiency demand a particular type of clothing, the requirements must be definite, a number of companies have pointed out the advantages in employee goodwill of trying both individual and group suggestion for the adoption of the desired type of uniform before making it compulsory. One plant, for example, which has recently put on a campaign to get women to wear slacks or overalls has listed the advantages of such clothes in the employee magazine along with pictures of attractive young employees in the various types of recommended suits. To avoid objections to the expense of the uniforms, some companies provide them without charge to the employees. One company reported that it also pays for the laundering.

Instances of very practical complaints against the required uniform suggest the importance not only of selling the women on the idea before changing to stricter clothing rules, but also the value of getting the advice of a woman's committee on the type or types of uniform, the style, material, and color. Complaints can also be minimized by setting the essential requirements such as low-heeled shoes, slacks, and short-sleeved shirts, but letting the individual choose her own outfit either from the retail stores or through the company or employee's cooperative store.

B. Changes in the Plant

1. *Improved working conditions*

The most common response to the question concerning the effect of the increasing employment of women on working conditions was that the company made an effort at all times to maintain good working conditions both for men and women. It is evident that many companies take pride in keeping their working conditions above the legal standards. However, the ability to do this varies considerably with the plant, and is much easier in modern plants where ventilation, lighting, and lay-out are well planned than in old buildings. A California survey of the employment of women in defense industries concluded that women are more affected by unpleasant surroundings than men:

> "The efficiency of women workers and their productivity were considerably higher in plants providing a favorable working environment.

This relationship between working conditions and production generally held true for men, but to a lesser extent."[1]

In addition to the probability that women's productivity is improved by more pleasant, more comfortable, and less noisy working conditions, there are certain specific items which need to be considered when women are to be placed in jobs previously held by men. These may include: (1) reengineering of the job so that women need not do any heavy lifting, high stretching, or climbing around a machine; (2) relocation of the job if it is near a department where there are unpleasant or hazardous dusts and fumes and excessive noise; and (3) a seat for each woman worker, and organization of the work to permit her to be seated for most of the working period.

2. *Rest rooms*

When a company is employing women for the first time, adequate toilet and rest rooms must be provided in advance. Employment offices have reported that in case of small companies where the plant is already crowded for space, the need for additional wash rooms may interfere with the hiring of women. A few instances have been mentioned of concerns which have lost government orders because rest room facilities for women have not been approved by inspectors. The Women's Bureau suggests the following as minimum standards:

> "Washing facilities in convenient locations with hot and cold water, soap, and individual towels. Dressing rooms next to washrooms with adequate care of clothing. Rest rooms with beds for workers taken sick, comfortable chairs and couches for use in rest or lunch periods.
>
> "Toilets for women in locations convenient to workrooms; a ratio of at least one toilet to every 15 women."[2]

The companies which have made necessary changes do not consider the cost a large item, and the problem is more frequently one of space than of cost. The inadequacy of present rest rooms in a good many companies seems to be the result of underestimating the rapidity and extent of the increase in the employment of women.

The importance of light, airy, and clean rest rooms with comfortable chairs cannot be overemphasized in connection with the health and efficiency of women workers. A pleasant rest room is considered particularly desirable when there is no lunch room and the rest room is the

[1] California Department of Employment. *Employment of women in the national defense program.* Los Angeles. November, 1941. p. 9.

[2] United States Department of Labor, Women's Bureau. Bulletin No. 173. *Standards for employment of women in industry.* 1930. 9 pp.

only place where a woman can relax for a few minutes away from the noise of the production department.

3. *Lunch rooms*

A majority of the companies surveyed have employee cafeterias or lunch rooms where meals are available at reasonable rates for the production workers of all shifts. In some of these firms where a large increase in employment has overtaxed facilities for the usual lunch time, arrangements have been made to stagger the lunch periods. Some of the plants which do not have an employees' lunch room are located near public restaurants and provide a 45-minute lunch period to give the workers time to go outside for their lunches. However, there appears to be an acute need for attention to this problem, and as lunch periods are shortened and the number of employees increased, the question of providing food for workers on all shifts becomes more serious. One company stated that its only lunch room was not nearly sufficient in size to take care of all the employees and also was so located that it was used only by the one department most convenient to it. It is apparent that similar conditions exist in other companies, and more and more frequently employees in certain plants or parts of plants must bring their own lunches, with no supplementary food available except from canteens supplying principally candy and soft drinks.

Where lunch facilities were reported to be unsatisfactory, the companies were facing one or both of two problems—the need for a longer lunch time, and space for one or more lunch rooms. A few companies were using movable lunch wagons and felt that an employee was much more likely to eat a nourishing meal with this arrangement than if dependent entirely on his or her own lunch box. The movable lunch wagon, however, only partially substitutes for the lunch room, since the latter provides a change of scene and a comfortable place to eat as well as food. As suggested above, women are more affected by their surroundings while working or eating than men, and it is felt that they are less likely to eat an adequate lunch if they have to eat at their workplaces. Many companies recognize the fact that a very light lunch, after the even lighter breakfast that many women have, is not enough to maintain a woman's efficiency throughout the day nor her health over a long period.

The firms which have well equipped lunch rooms large enough to provide table space for those who bring their own lunches as well as for those who patronize the cafeteria feel that the investment shows profit-

able returns in terms of employee morale, health, and efficiency. One company also suggested that, in these days of increasing labor turnover, a good lunch room may be a factor in attracting and keeping a high type of woman worker. One executive who reported some difficulty in getting lunch room equipment said that, especially since women were going on the second and third shifts, he felt a lunch room was so essential to the health, safety, and efficiency of his employees that the equipment should be given the same priority as new production machinery.

The problem of providing a satisfactory mid-shift meal for industrial employees has received a great deal of study in England. In 1940, a Factories (Canteens) Order specified:

> "The occupier of any factory in which more than 250 persons are employed and in which is carried on the manufacture or repair of any munitions of war or of any materials, parts or tools required for such manufacture or repair, or any work on behalf of the Crown shall, if so directed on behalf of the Minister by the Chief Inspector of Factories or by any other Inspector of Factories expressly authorised by the Minister to give directions under this Order, make arrangements to the satisfaction of the Inspector for the establishment and maintenance, in or in the immediate vicinity of the factory, of a suitable canteen attached to the factory or to a group of factories where hot meals can be purchased by persons employed at the factory or factories."[1]

The Factory Inspector's report from which the above was quoted points out certain difficulties to be overcome even when the employers are convinced that canteens are necessary. These are principally a hesitation to go to the expense of building lunch rooms that may not be used for long, and a shortage of building supplies and canteen equipment. Since, at the best, it takes several weeks to prepare a canteen, the Factories' Inspector's report suggests:

> "As a temporary measure, works are encouraged to distribute food from their main canteen if this is within reach, or otherwise to adopt temporary expedients, including the use of mobile canteens. . . . It should, however, be clearly understood that . . . voluntary mobile canteens are given for emergencies only and should not be allowed to relieve others of their legal responsibilities or be used as an excuse for not providing permanent canteen facilities."[2]

[1] *Annual report of the chief inspector of factories for the year 1940.* London. H.M. Stationery Office. 1941. p. 14.

[2] *Ibid.* p. 16.

C. Medical Service

1. *Hospital facilities*

The medical service provided by the companies surveyed ranges from the minimum of first-aid facilities to a well-equipped plant hospital with a staff consisting of a full-time physician in charge, an oculist and dentist at regular hours, and several nurses. Principal changes which were stressed as important in connection with the increased number of women employees were additional examination, first-aid and hospital rooms for women, and additional nurses to be in charge of the new first-aid and hospital units and on all shifts on which there were any women employees. One large company reported that it had just added a woman physician to its medical staff, and that she was in charge of all physical examinations of women as well as responsible for the first-aid and advisory health service for the women employees. Another company is counting on employing several women physicians, both because the percentage of women in the organization is increasing, and because so many medical men are going into the army.

First-aid rooms and medical service, like provisions for lunch rooms, seem to lag behind the need for expansion. A number of the companies visited felt that present space and services were inadequate. While the smaller companies were not aiming at a full medical staff, the minimum standards desired are a regular part-time physician for examinations and supervision of the health of the plant, at least one nurse on duty on each shift, and a separate first-aid and rest room for women employees. Where a doctor is only on call, a nurse who is acquainted with the plant may be assigned responsibility for health conditions. One company reported in this respect:

> ". . . The Senior Nurse at each plant is responsible for inspecting the working places and rest rooms of women employees as to safety, healthfulness and cleanliness. She reports to the Plant Personnel Manager any unhealthful or undesirable working conditions, and follows up on their correction. She also speaks to the girls, individually, or in groups, about safe apparel for work, use of any safety appliances provided, and orderliness of their locker rooms."

2. *Precautions against occupational disease*

Experience in the last war showed the great need for constant alertness to the health hazards of new processes and new materials. Since women may show more susceptibility to certain materials, dusts, or fumes than men, a number of companies stated that they were taking

all possible precautions against such developments. For the most part, if a substance—such as lead—is known to be more injurious to women than men, they are kept away from it. In other cases, where ill effects are apparent on some women but not on others, they are kept under regular medical observation. One company told of a study of preventive methods in connection with the use of radium paint being undertaken jointly by management and the state department of industrial hygiene. Other reports of industrial health hazards to women referred to dermatitis, caused by dust or oil, and to the ill effects of carbon tetrachloride. In one concern, women who show susceptibility to tetrachloride are immediately moved to other work; in another company, both men and women working with this chemical are examined every three months.

The principal danger in regard to industrial diseases of women would seem to be in the small companies where there is no full-time medical director to observe the varying effect of chemicals and dusts on women who may be exposed to them for the first time. As suggested above, where no doctor is in charge of the plant health department, the head nurse should be given the specific responsibility of considering health conditions and calling any indication of dangerous developments to the attention of management and a qualified physician.

3. *Sickness and hospital benefits*

Approximately one-half of the companies included in this survey have some kind of sickness benefit plan for their employees. These apply to both men and women, but in a few cases, weekly benefits are somewhat lower for women than for men because the sickness rate is higher for women. Companies and benefit associations may face the need for readjustment of benefit schedules if the proportion of women in the plan increases greatly. Only one company is known thus far to have suspended the right of new women employees to join the plan. England has found that more hospitalization is needed when women are required to accept jobs away from home. It might be expected that a similar need will arise in this country as women move to industrial centers to go into war work. In any case, at home or away from home, the demands of an industrial job and household duties are likely to increase the sickness rate among women. These new employees in industry will need the protection of sickness benefit plans just as much as any other employees. Companies which continue their benefit programs as usual, making them applicable to all employees after the short service requirement is met, expect to gain in the long run both in the improved health of their employees and in goodwill. Although mutual

benefit and hospital associations may have to increase their dues and decrease their benefits to women, these associations can help to provide needed protection for this group by advertising the benefits of membership and making membership as attractive as possible. In addition to their own benefit plans, some companies cooperate with community health services and keep their employees informed on the availability and value of these services.

VII. PROBLEMS OUTSIDE THE PLANT AFFECTING WOMEN'S WORK IN INDUSTRY

EMPLOYERS both in England and the United States have for some time recognized the fact that conditions outside the working environment may affect a man's or woman's productivity as much as conditions on the job. The off-the-job part of a woman's life is likely to be more important to her than her industrial work, and especially is this so of the large group of women who will enter war work only on a temporary basis. To encourage women to enter war industries and at the same time to help them to continue to carry their family and household responsibilities will require the cooperation of both industry and government with community social and educational agencies. The questions facing the individual company are: (1) which of these social and personal problems of their new employees are management's concern, and (2) what specifically can management do to help solve them.

A good many managements, already overworked with production problems, are eager to avoid any responsibility for personnel matters that do not deal directly with the employee on the job. Other companies, particularly those with long established plans for employee benefits and recreation, are more willing to expand their programs and give careful study to off-the-job needs of the new women workers. More definite thought seems to have been given to the responsibility of industry in this respect in England than in the United States. Opinion in England, developed from experience which we are just encountering, may be a guide to our own planning. In its leaflet, "The Employment of Women—Suggestions to Employers," the Ministry of Labour and National Service states:

> "Other women will possibly have young children to get off to school or nursery before they can come to work. Arrangements should be made to accommodate their hours to those requirements.
>
> "It will be urged in objection that management becomes disorganized when special arrangements of this character have to be made for individuals. To this, the answer is that the paramount consideration is to make it as easy as possible for women to enter the factories and, to that end,

there is no alternative but to adapt factory practice to the present situation."[1]

The employer's point of view on outside welfare is presented in a pamphlet issued by the Industrial Welfare Society:

> "It is not easy to define how far the welfare and personnel department should extend its activities to cover matters affecting employees outside factory hours. Certainly there should be no interference with the personal freedom of workers to do exactly as they wish in their leisure time, but practical guidance and help" may be given on such questions as transport, lodgings, recreation, hobbies, legal, domestic and financial difficulties, medical care, and any possible help to employees in the fighting forces and their families.[2]

A. Transportation

The special difficulties connected with transportation to and from early and late shifts were discussed in Chapter IV. In many communities, transportation has become a serious problem for all shifts, and employers are concerned with the effect of inadequate transportation upon lateness, attendance, and efficiency. The factors in the situation differ but are almost equally serious in crowded cities and for isolated plants in rural areas. In some of the latter cases, bus service is provided to the nearest towns. This may, however, require some of the women to walk a considerable distance. As one person commented, the total exertion of eight hours factory work, a long bus ride with perhaps some distance to walk, and household duties is more than any but the most energetic young women can stand for more than a short time.

Although congested traffic has been a problem for individual drivers, the most satisfactory means of transportation for many workers has been their own or a neighbor's car. As tire and gasoline restrictions limit the use of private automobiles, the transportation problem will become more acute. In some cases, the new union-management production committees are helping by stressing the need for a full passenger load in any car driven to and from work and arranging for cooperation in this respect among groups of employees. A complicating factor occurs when hours of work vary for employees living in the same neighborhood. This is frequently the case in companies in which men are called upon to work much more overtime than women. Staggered hours schedules have been found to help greatly in lowering the traffic peaks and facilitating the fuller use of public buses. Staggered

[1] *The Employment of women—suggestions to employers.* March, 1941. p. 4.

[2] Industrial Welfare Society. *Elements of industrial welfare and personnel management.* London. 1940. pp. 11-12.

hours on a three-shift system may, however, make early and late transportation even more difficult for workers who normally ride to and from work together. It is possible that the staggered system should apply only to employees on a regular day schedule, and not to those on shift schedules.

The factors involved in the transportation of industrial employees are so many and so varied that no general solution is possible. However, many companies agree that industry, employees, and the transportation companies must work together on the problem. In addition, a number of concerns have reported that they make sure that women applicants living some distance from the plant have satisfactory means of getting to and from work before they are hired. In cases of new plants, this may involve housing arrangements.

B. Housing

Like transportation, housing is not a problem that can be solved by a single company. Heretofore, most of the workers moving into defense-industry areas have been men and usually heads of families. The need has been for more houses rather than for rooms for single persons. The need for more family units is still acute in many industrial areas, and added to it now is the need for dormitories or other safe and pleasant living arrangements for the young women who are entering war work. Where munitions plants employing many women are built in rural areas, special dormitories may be essential. These are already in operation in some places and are under construction in others. The buildings are usually put up by a government agency and the dormitory may be under government or company management. In either case, management cannot help but be concerned with the need for comfortable and healthful housing because of its effect upon the morale, health, and productivity of the women workers—many of whom may be living away from home for the first time.

In large industrial areas, the individual company can have considerable influence on housing needs through its employment policies. Giving preference in employment to wives, sisters, and daughters of men employees and using the local supply of women to as great an extent as possible may be a very important factor in preventing a more serious housing shortage. However, in certain communities, there has already been a large enough influx of women workers to cause overcrowding, high rents, and generally unsatisfactory living arrangements for many women in war industries.

The situation apparently is not yet as serious anywhere in the United

States as in areas in England where compulsory billeting is in force. But even now in some communities, and eventually in many others if the transfer of women workers from one community to another assumes larger proportions, consideration might profitably be given to adopting some of the features of the British program for assisting transferred war workers.[1] Probably industry should not be responsible for housing and room arrangements for its employees, but it can take a number of steps to improve the situation: (1) employ local women; (2) have someone of the personnel staff available for the employees of each shift to discuss living arrangements; (3) use company influence to see that community agencies are established to help industrial workers with these problems; and (4) cooperate with community agencies by keeping them informed of the problems that are reported by the employees and by considering any adjustments in personnel policies which might improve the situation.

C. Recreation

Recreation and housing are closely related wherever there is a housing and room shortage, and especially where dormitories are built in isolated areas. In such cases, recreational facilities may be a part of the housing planning, or other community agencies may make arrangements to provide social rooms and activities, especially for the young, unmarried workers. Aside from the housing problem, however, many firms have recognized the fact that the introduction of shift schedules has upset the normal social life of many of their employees and that assistance should be given to help them make as satisfactory an adjustment as possible to new and abnormal hours of work. Managements are giving this assistance either directly through company recreational programs or in cooperation with agencies such as the Young Men's and Young Women's Christian Associations.

One company club which is extremely popular with the employee group is located in a building near the plant and is now open from 7. A.M. to 11 P.M. Another company has its club rooms open from 6:30 A.M. to midnight and encourages the men and women on each shift to form bowling clubs and participate in other group activities. The club rooms outside the plant have been found much more satisfactory under present conditions when plant protection rules make it difficult for employees to enter the plant other than for the regular work period. Problems and arrangements for recreation vary for

[1] See: *Welfare work outside the factory*. Ministry of Labour and National Service. 1941.

rotating and non-rotating shifts. In the latter case, plans are made to provide group activities for women on the second shift in the afternoon before work, and for women on the third shift immediately after work, that is in the morning. To make such a program possible, the employees must be able to get supper or breakfast in or near the plant or recreational building. One company with a system of rotating shifts reported particularly satisfactory experience with the development of various teams from each shift and social occasions arranged for the week that the shift was on the daytime (7 A.M. to 3 P.M.) schedule.

D. Provision for the Care of Children of Working Mothers

The great increase in the employment of women in industrial work and their use on second and third shifts has aggravated an always difficult community problem—the need for adequate supervision and care of the children of working mothers. A number of companies have felt that the best help they could give on this problem was to avoid it as much as possible by refusing to hire mothers of young children. However they are finding it hard to maintain such a policy in a tight labor market, particularly since the women considered most satisfactory for industrial employment are of the same age group as the mothers with children of pre-school or early school age. While the problem may be kept within reasonable bounds by discouraging the employment of mothers, financial needs or other personal reasons may make the woman seek work and, if she meets the employment qualifications, a company now hesitates to turn her away. The present seriousness of the problem in many communities suggests that it is one that cannot be avoided in any town or city in which women will be employed extensively in war industries.

Arrangements for the care of children of working parents is, like transportation and housing, a matter for community cooperative effort. Thus far in this country, the planning for and administration of such projects as day nurseries, visiting or full-time housekeepers, and foster homes have been carried on principally by private social work agencies. Now that woman's employment is so essential to war production, both industry and government have a stake in these activities. Semi-governmental committees are being set up in some communities, state welfare departments are studying the problem, and the United States Children's Bureau is giving federal encouragement to attempted solutions of the problem.

One community, Bridgeport, Connecticut, has made noteworthy progress in a cooperative approach to the problem. The initiative in this

case was taken by the Social Welfare Committee of the Civilian Welfare Division of the Bridgeport Defense Council. This Committee, composed of a lay chairman, six social workers, and representatives from the Congress of Industrial Organizations, the American Federation of Labor, the Manufacturer's Association, retailers, and insurance companies secured acceptance by industry of the following statement of practice:

> "(1) To employ no mothers until all other possible resources have been exhausted.
>
> (2) To have their employment managers talk to all mothers before employment, and to make sure that their children are well-provided for. If provision seems unsatisfactory, refer them to the Department of Public Welfare where, in conjunction with other social agencies, an effort will be made to care for the children.
>
> (3) To give whenever possible the mothers a choice of shift, and whenever possible not to rotate them."

Another committee undertook a study of the extent of the problem and the development of plans to meet it. This committee of the Council of Social Agencies, is made up of three public school principals, four social workers, and a representative of the parochial schools. Partial findings of this group revealed that approximately 25 per cent of all the children in grade schools and junior high schools in Bridgeport have both parents working. The committee recommends enlarged services of already existing agencies and, through the schools, the churches and mothers' clubs, urges mothers to first take care of their immediate responsibilities and see that their children have adequate care before they themselves take a job.[1]

In England, the development of day nurseries and other arrangements for the care of children of working mothers has been principally the responsibility of the Ministry of Health, except where, in a few instances, factory managements have set up day nurseries in connection with the plant. An official report of the Government's position in this matter states:

> "38. The great increase in war work of all kinds and the calling-up of men for service in the Armed Forces have necessitated the employment in factories of an ever-increasing number of women. In June, 1940, the Ministry of Health arranged at the request of this Ministry that where the provision of day nurseries was found to be necessary in order to free young married women for war work, the Government

[1] Information secured from Mrs. Alvin C. Breul, Chairman, Social Welfare Committee, Bridgeport Defense Council.

would pay the local authority one hundred per cent. of approved expenditure on the adaptation and equipment of premises and one shilling per diem for each child accommodated. Nurseries established under this scheme are open to the children of women recruited for work in factories which are engaged on Government contracts and other work of national importance. . . . In June, 1941, the financial arrangements were revised, the distinctions between various types of wartime nurseries in evacuation and reception areas were abolished, and the Government bears the full approved expenditure on all of them, after taking into account contributions from parents. . . . Under the new arrangement Maternity and Child Welfare Authorities, who will be responsible for the establishment of wartime nurseries, will be approached directly by Welfare Officers whenever nursery provision is felt to be necessary.

39. In order to free for war work the mothers of slightly older children and of children of school age, the Board of Education have encouraged in these areas the increased provision of meals at school, and consideration is being given to arrangements for the care of school children outside school hours.

40. Early in 1941 it became apparent that the provision of nurseries on a scale sufficient to meet in full the Government's needs for the increased employment of women would be impossible owing to difficulty in obtaining staff, premises, and equipment. Some other solution had, therefore, to be found, and a scheme was worked out for state registration of childminders. Where this scheme is in operation women who are prepared to act as minders apply for registration to the Maternity and Child Welfare Authority. Any woman in full-time work who wishes her children under five years of age to be taken care of may place them in charge of any registered minder. A Government subsidy of sixpence per day per child or eightpence per day and night is payable to the minder. This scheme is being tried out in a small number of areas."[1]

There have been many criticisms in British personnel journals and publications of the Labour Party of the inadequacy of arrangements and the delay of the Ministry of Health in approving local plans. From these criticisms and current developments in the United States, one may draw certain conclusions as to important factors in an efficient handling of this problem:

1. Arrangements are best worked out through local planning. State or federal agencies may assist local activities and, if necessary, take the initiative in starting them, but some one committee or agency in the community should be responsible for the development of a program in line with local needs. This committee should in-

[1] Ministry of Labour and National Service. *Welfare work outside the factory.* 1941. pp. 11-12.

clude, at least in an advisory capacity, representatives of industry, trade unions, and the schools.

2. Nurseries in connection with factories are impractical except in rural areas.

3. Full-time nurseries are essential when mothers are working on any other than the regular day shift.

4. Family allowances to make it unnecessary for the mother to seek employment may be more economical than provision of nurseries when there are several children of underschool age in one family.

5. Part-time employment may be an essential step in securing the maximum use of women in war industry without serious disruption of normal family life.

The individual company cannot of itself undertake to solve these "outside welfare" problems. However its personnel policies can help reduce the extent of the problems and its cooperation and influence in community agencies can greatly facilitate their solution.

VIII. SUMMARY

NO one questions the fact that women's work in war industries will require many adjustments in previously established personnel policies. What is perhaps not so evident is the need in some cases of changes both in the philosophy of personnel administration and its application. New approaches are necessary when the national emergency brings into industry many women who have never before had any employment outside their homes. Managements which have long recognized the value of sound industrial relations are alert to new trends and see the wisdom of taking the leadership in attempted solutions to new problems. From a study of developments in such companies and of British experience, certain points stand out as possible guideposts. The following items may serve as a check list of activities to be given consideration by any company facing the prospect of new or increased employment of women in production work:

1. A preliminary survey of the whole plant to determine on what jobs women can be placed at once, and which jobs they could handle if a much wider substitution of women proves necessary.

2. Advance discussion concerning the introduction of women with supervisors and union leaders.

3. The extent of job reengineering required where women may be substituted for men.

4. The need for any changes in the physical plant, including relocation and changes in production departments, additional rest rooms, new or increased lunch-room space, and additional first-aid rooms.

5. The available pre-employment training facilities and the extent to which these can be used to advantage.

6. New recruiting methods. Should the company itself develop new sources of labor supply or depend more upon the public employment offices?

7. Revisions in employment policies affecting women. Are requirements as to age, education, and marital status limiting unnecessarily the choice of women applicants? Are a woman's home responsibilities considered in accepting her for employment?

8. Revisions in employment procedures. Do job specifications and application forms fit the new requirements, and are interview questions, tests, and physical examinations adapted to the employment of women on new types of work?

9. Induction procedures. Do they give sufficient attention to the adjustment of women to industry, and emphasize the importance of the individual's work to war production?

10. New training problems. Does the job training require strengthening in any department, and should the upgrading training program be extended to women?

11. If the personnel staff is expanding, is there need for special training for men and women new to personnel work? Could the company cooperate with educational institutions to develop satisfactory short-time training in this field?

12. Determination of the most satisfactory daily and weekly hours of work for women in the light of available reported experience and opinion, and in accordance with the company's own experience. Is a third or fourth crew needed to limit women's hours to the accepted optimum?

13. Separate absence, turnover, accident, and production records for men and women.

14. Exit interviews and interviews with employees with poor attendance records. Can these interviews be used to better advantage to determine the basic causes of high absenteeism and labor turnover?

15. Factors involved in shift schedules for women. Will rotation or non-rotation be most satisfactory to the majority of your employees? Can mothers of young children and employees whose transportation is most difficult at night be given special consideration in shift assignments?

16. The need of at least a 30-minute lunch period and the value of additional regular rest periods.

17. Women's wage rates. Weigh both internal and external wage conditions and trends in developing a wage policy in regard to women who are being placed on men's work. If previously established differentials are to be maintained, consider the possibility of upgrading the older women employees to the new and better paid jobs.

18. Special safety efforts in connection with new women employees. Can accidents among this group be prevented or reduced through improved safety instruction, better safety devices, and stricter clothing rules?

19. An adequate medical service. Is there provision for thorough physical examinations for women? Is a nurse in attendance on all shifts on

which women are employed? Is someone responsible for continuous observation of working conditions with particular concern for any new industrial disease hazards?

20. Cooperation with community agencies on outside problems which affect the employees' productivity. Can management increase the efficiency of its employees by cooperating with civic agencies, labor unions, and other companies in improving transportation, housing and recreational facilities?

Some companies may consider the activities mentioned in the last item as outside their area of responsibility. The impact of a national emergency, however, brings new problems to industrial workers, and many of these problems can be solved only with the assistance of the employers. Managements and unions are being encouraged to cooperate to secure maximum production through improved in-plant conditions and methods. Personal problems outside the plant likewise affect the attitudes and productivity of employees, particularly of the women workers with home responsibilities who are entering industry for the first time. The cooperation of industry, labor, government, and community social and educational agencies is essential if women are to be of the greatest service to war industries and to their country.

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McKelvey, Thelma. *Women in war production.* New York. Oxford University Press. 1942. 32 pp.

Reviews the types of industrial work in which women may be employed, steps to be taken to assure the best use of women workers, and social factors influencing the greater employment of women.

National Industrial Conference Board, Inc. (247 Park Avenue, New York). Studies in Personnel Policy, No. 41. *Women in factory work.* 1942. 52 pp.

This report includes discussion of the principal personnel activities affected by the employment of women. Emphasizes particularly the types of work women can do, and methods in recruiting and selection. Quotes extensively from British and American studies.

UE News (261 Fifth Avenue, New York), November 1, 1941. "District Four conference maps program for women." pp. 1-2.

Reports of a conference discussing women and national defense wages, working conditions and job opportunities, and organization and leadership among women. The conference adopted a resolution endorsing "equal pay for equal work."

United States Department of Labor, Women's Bureau. Bulletin No. 12. *The new position of women in American industry.* Washington. Government Printing Office. 1920. 158 pp.

A study of the employment of women in specific industries during and after the first World War and of the results of substitution of women for men in specific occupations.

Experience as to standards for women's work in periods of rapid increases in production. October, 1939. 16 pp. Mimeographed.

Brief statements in regard to increase in employment, 1914-1918, relaxation of state labor laws, efforts to maintain standards and evidences of ill effects from their relaxation.

Special Bulletin No. 1. *Effective industrial use of women in the defense program.* 1940. 22 pp.

An outline with brief discussion of factors which "have been found of utmost importance in a program aimed to secure successful production in part through the employment of women."

Report of the Conference of the Women's Bureau Advisory Committees, United States Department of Labor, Washington, D.C., January 21-22, 1942. 25 pp.

Summary of committee recommendations by topic and reports of the separate committees.

Foreign

Bondfield, Margaret G. "Women in war industries: British experience." *Training workers and supervisors for war production.* American Management Association (330 West 42nd Street, New York). Personnel Series No. 56. 1942. pp. 11-16.

A short description of the place of women in British war industries, and policies as to training, hours of work, wages, and working conditions.

Great Britain. Ministry of Labour and National Service. *The employment of women—suggestions to employers.* London. March 24, 1941. 4 pp.

Recommends the appointment of a woman personnel officer wherever a company expects to employ a large number of women, outlines the functions of this officer and lists items requiring special attention in connection with the employment procedures, introduction to the job, and hours of work.

Annual report of the Chief Inspector of Factories for the year 1940. [Cmd. 6316.] 1941. 24 pp.

The regular report of the Chief Inspector on accidents and accident prevention is followed by a special report relating to the welfare of industrial workers, hours of work, and health in factories. The section on hours deals particularly with the hours worked by women and young persons.

Greenfeld, Judith. "Women's work in Russia's planned economy." *Social Research* (66 West 12th Street, New York), February, 1942. pp. 22-45.

A summary of the history of the attitude towards women in industry since the 1917 Revolution, the fluctuations in their employment, and the effect of the increased use of women in defense work since 1936 on Russia's total preparedness.

Industrial Welfare and Personnel Management (London), September, 1941. "Taking on women workers." pp. 191-192.

Practical advice as to employment and welfare arrangements involved when a company employs women for the first time.

International Labour Review (734 Jackson Place, Washington, D.C.), December, 1941. "The employment of women in Germany under the National-Socialist regime." pp. 617-659.

A long article covering numbers employed, wages and hours' policies, regulation of conditions of work, and training for the years 1933-1940.

March, 1942. "Recent aspects of the employment of women in Germany." pp. 286-296.

A summary of German documents and publications showing the effort to protect women against harmful conditions of work while making the greatest possible use of female labor power. Some of the standards reported are: no heavy lifting, protection against industrial poisons, maternity leave and adequate protection for pregnant women, 8 hours' work limit and no night work except in very special cases, emergency maximum work week of 56 hours, and legal provision for rest periods.

Labour Management (London), January, 1942. "The industrial front in Germany," by T. Prager and M. J. Wilkinson. pp. 10-15.

A section on women in industry gives data on the extent of women's employment and occupations in which they are employed, provisions for the care of young children, time off for household work and shopping, the use of women welfare workers, and wages.

February, 1942. "A survey of the problems of the employment of women in war-time," by Pamela J. Gauntlett. pp. 23-28.

Outlines the problems in England, including training, wage rates, hours, shopping, transport, canteens, care of children, and transfer to essential work—and makes recommendations for solving them on a basis satisfactory to the women employees.

United States Department of Labor, Women's Bureau. *Women in war industries in Great Britain.* Washington. October, 1941. 22 pp. Mimeographed.

A summary of all phases of the subject: women and the labor supply, processes done by women, training, subdivision of industrial processes, wage rates, health, and personnel problems.

The employment of women in Canadian gun and rifle factories. January, 1942. 13 pp. Mimeographed.

A description of the operations performed by women, and a brief statement of employment standards and occupational hazards.

Employment and Training

United States

Amidon, Beulah. "Arms and the women." *Survey Graphic* (112 East 19th Street, New York), May, 1942. pp. 244-248, 271.

Deals especially with the estimated number of women needed for defense production work, the sources of this required woman power, and the need for a stepped-up training program for women.

Anderson, Mary. *Women's jobs in war industries.* United States Department of Labor, Women's Bureau. Washington. February, 1942. 10 pp. Mimeographed.

Talk given before the American Management Association Conference. Points out the need of a more rapid induction of women into war industries, refers to successful experience in their use on many types of machine jobs, and outlines recommended standards for working conditions.

California Department of Employment, Occupational Analysis Section, *The employment of women in the national defense program.* Los Angeles. November, 1941. 59 pp. Mimeographed.

Summarizes the motivating factors in the employment of women, methods of selection, and changes in working conditions. Gives the list of occupations found suitable for women workers. In conclusion, suggests that women can fill almost any jobs that men can, and recommends that employers consult their public employment office for assistance in selection, and the Board of Education for assistance in training prospective women employees.

The Conference Board Economic Record (247 Park Avenue, New York), February, 1942. "Women, as war labor reserves," by M. R. Gainsbrugh and I. J. White. pp. 47-50.

Statistics on female employment, 1914-1939, and in war industries, 1939 and 1941, and a discussion of the "large and abrupt increases that may arise in war industries."

The Employment Review (The United States Employment Service for New York, 342 Madison Avenue, New York), February, 1942. "Employment opportunities for women in industries related to defense." pp. 97-110.

Statistical data on trends in 1941 in the employment of women, and in number of placements by the State Employment Service are supplemented by a discussion of employers' attitudes towards the utilization of women in defense industries, estimates of potential hiring in different industries, need for and frequency of defense training courses for women, and maintenance of labor standards.

Independent Woman (1819 Broadway, New York), May, 1942. "On registering women." pp. 145-146.

Reports four out of five voters in an opinion poll in favor of compulsory registration of women, but opposition to compulsory registration now by the Director of the United States Employment Service and other observers of the employment of women in defense industries.

Monthly Labor Review (Government Printing Office, Washington), May, 1941. "Employment of women in defense industries." pp. 1147-1151.

Possibilities of employment of women, estimates of number available, need for greater inclusion of women in defense training courses, and types of work that women have performed satisfactorily.

Owens, Marion E. "Women personnel executives." *Personnel Journal* (60 East 42nd Street, New York), March, 1942. pp. 298-316.

The report of a study of the duties, training, and education of women personnel executives.

Stewart, Maxwell S. "Shall we draft women?" *The Nation* (55 Fifth Avenue, New York), April 25, 1942. pp. 483-486.

Considers the need for the much more extensive use of women in war industries, and recommends compulsory registration.

United States Department of Labor, Women's Bureau, *Increase in woman employment 1914-1918 and occupations of women in defense industries.* Washington. September, 1940. 22 pp. Mimeographed.

Women's factory employment in an expanding aircraft production program. May, 1941. 25 pp.

Employment of women in the manufacture of artillery ammunition. 1941. 31 pp.

Employment of women in the manufacture of small arms ammunition. June, 1941. 18 pp.

The employment of and demand for women workers in the manufacture of instruments—aircraft, optical, and fire-control, and surgical and dental. November, 1941. 21 pp.

Based on studies of work performed in plants and arsenals, jobs which women could handle after a short training period are described, and recommendations given for the employment of women.

United States House of Representatives, Committee Investigating National Defense Migration. *Women in war production.* Testimony of Thelma McKelvey. Washington. February 4, 1942. 69 pp. Mimeographed.

A résumé of the proposed plans for making the best use of the potential supply of women workers in the war effort. These plans include use of the United States Employment Service, and all available training facilities, assurance of suitable conditions of work, and perhaps compulsory registration.

United States War Production Board, Labor Division, Training within Industry. Bulletin No. 7. *Increasing war production through employment of women.* Washington. March, 1942. 4 pp.

Outlines the special factors to be considered in the employment of women, selection and placement of women workers, and the fundamental steps in training.

Great Britain

Aeronautical Chamber of Commerce of America (15th and H Streets, N.W., Washington, D.C.). Information Bulletin No. 1. *Utilization of female help in aircraft plants in Great Britain.* January 3, 1942. 17 pp. Mimeographed.

Three articles by R. W. Hambrook: "Women in defense industries in England," "Training for women in England," and "Aviation training for women."

Industrial Welfare and Personnel Management (London), December, 1939. "Women in the war industries," by Verena Holmes. pp. 451-454.

Deals principally with the need for women supervisors and gives the syllabus for a forewoman's training course given by the South East London Technical Institute.

Labour Management (London), October, 1940. "Emergency training scheme for personnel management." pp. 153-154.

Text of a memorandum issued by the Ministry of Labour outlining the procedures and facilities afforded for the intensive course in personnel management.

April, 1941. "Training for personnel management, the Ministry of Labour scheme." pp. 53-54.

Description of the training course by a member of the first contingent at the London School of Economics.

January, 1942. "The crisis of man-power." pp. 3-5.
A summary of the National Service Act, and report of a talk by R. M. Gould on procedures in the transfer of women to vital war work.

Ministry of Labour Gazette (H. M. Stationery Office, London), February, 1942. "Employment of women (control of engagement) order." pp. 52-53.
Order effective February 16, 1942 forbids the employment of women between the ages of 20 and 31 other than through an approved employment office, with the exception of certain specified employments and persons.

Hours of Work and Wages

United States

Beyer, Clara M. "The effect of war production on labor standards." *Social Service Review* (5750 Ellis Avenue, Chicago), March, 1942. pp. 57-63.
A summary of developments in the relaxation of standards—particularly hours of work—and efforts at the same time to preserve peacetime standards as far as possible. Includes a statement by the Secretary of Labor in regard to state policies in granting exemptions.

Dayton Union News (United Electrical, Radio and Machine Workers of America, Dayton, Ohio), February 4, 1942. "Manufacturers anxious to break down women's hours," and "Dayton U E women protest longer hours." p. 5.
Opposition to suspension of the Ohio Female Hours Act on the ground that longer hours increase accident hazards and fatigue, and that there were still many unemployed in Ohio.

Illinois State Federation of Labor Weekly News Letter (666 Lake Shore Drive, Chicago), March 28, 1942. "Illinois leads all states in violation of labor laws." pp. 1-2.

United Mine Workers Journal (Washington, D.C.), April 1, 1942. "Illinois war labor board adopts policies." p. 21.
Two points of view of organized labor toward the question of relaxation of labor standards in defense industries. The former article opposes relaxation of laws "through administrative edicts" and gives reports from forty-six State Federations of Labor as to permission for such relaxation. The latter article describes approvingly the Illinois War

Labor Standards Board set up to pass upon requests by war industries for exemptions from labor laws.

Labor Standards (Government Printing Office, Washington, D.C.), January-February, 1942. "All-out production and state hours laws." pp. 1-3.

Reports that the Division of Labor Standards of the United States Department of Labor is acting as a clearing house for procedures used by States in granting emergency exemptions to hours laws, gives statement of policy, and mentions the variations in the right to relaxation in State laws.

United States Department of Labor, Women's Bureau. Bulletin No. 156. *State labor laws for women, December 31, 1937*. Part I. Summary. By Florence P. Smith. Washington. Government Printing Office. 1938. 16 pp.

Bulletin No. 156-II. Part II. *Analysis of hour laws for women workers*. By Florence P. Smith. 1938. 45 pp.

Application of state hour laws to the employment of women on defense projects. December, 1941. 3 pp. Mimeographed.

Defines the types of defense employment to which state hours laws apply.

Great Britain

The Economist (London), November 29, 1941. "Women's pay." pp. 646-647.

Discusses the factors affecting the generally accepted principle of "equal pay for equal work." Points out that in wartime women are at a premium as workers, and suggests that "for efficient mobilization, no less than for the sake of fairness, it is necessary for this fact to be registered in the structure of wages."

Great Britain. Medical Research Council, Industrial Health Research Board. Emergency Report No. 2. *Hours of work, lost time, and labour wastage*. London. H. M. Stationery Office. 1942. 26 pp.

An investigation carried on in 1940 and 1941 in a few British factories shows higher absence and turnover rates for women than for men.

Industrial Welfare and Personnel Management (London), February, 1941. "Hours of work." pp. 27-29.

Points out the ill effects of long hours of work, and suggests shift arrangements to make the best use of the available supply of labor.

March, 1942. "Husbands on leave." p. 41.
"Notes on leave for married women employees, based on an enquiry covering about 50 firms."

Labour Management (London), May, 1940. "Problems of the employment of women on night work," by K. A. Harrington. pp. 72-73.
States that the women were generally cooperative in accepting night work, but points out difficulties in danger of insufficient sleep, overwork, increase in personal worries, greater difficulties in discipline, and the need to have the same arrangements for night workers as for day workers.

July-August, 1941. "Employment of women on part-time work." pp. 100-101.
An experiment at Standard Telephone and Cables, Ltd. which has worked out successfully, using women on two part-time shifts—8 a.m. to 12:30 p.m., and 12:30 p.m. to 5:30 p.m.

July-August, 1941. "'Rest breaks' for women and girl workers," by Edward W. Fox. pp. 103-104.
Description of a scheme to provide special hostels for two weeks "rest breaks" to avoid longer absence from work due to illness.

October, 1941. "Absenteeism." pp. 139-140.
Notes on reasons for absences and ways of reducing absenteeism.

Raphael, Winifred. "Problems of war-time attendance." *Occupational Psychology* (London), April, 1941. pp. 53-60.
Reports a tremendous increase in labor turnover and absenteeism since the war. Analyzes causes and suggests remedies.

Health and Safety

National Research Council, Committee on Nutrition in Industry (2101 Constitution Avenue, Washington, D.C.). *The food and nutrition of industrial workers in wartime.* 1942. 17 pp.
A consideration of the need for more attention to the diet of industrial employees, and practical recommendations to companies.

National Safety News (20 North Wacker Drive, Chicago), June, 1935. "Women are different," by Ellen D. McKeon. pp. 21-22, 59 +.
Discusses the type of accidents that occur among women, and suggests improved preventive methods.

Preliminary report on health of women in industry. Compiled by the Conference on "Physical fitness for women in industry." Young

Women's Christian Association (600 Lexington Avenue, New York). April, 1942. 5 pp. Mimeographed.

A proposed outline for a physical fitness program, considering both working conditions and leisure-time activities.

Safety Engineering (75 Fulton Street, New York), December, 1940. "Women in the defense program." pp. 6-8.

Considers the special safeguards on machinery, increased protection against industrial poisons, and improved plant sanitation that are necessary with the greater employment of women in industry.

United States Department of Labor, Bureau of Labor Statistics. Bulletin No. 249. *Industrial health and efficiency*; final report of the British Health of Munition Workers' Committee. Washington. 1919. 374 pp. Especially Section IV, pp. 46-63.

Section IV of the Final Report of the Committee summarizes its findings on "the industrial employment of women."

United States Department of Labor, Women's Bureau. Special Bulletin No. 2. *Lifting heavy weights in defense industries*; methods for conserving health of women workers. Washington. 1941. 11 pp.

Suggestions for the use of mechanical devices to avoid unnecessary lifting, and for instruction in the proper methods of lifting. Recommends regulation of weight lifting through authority to inspect, advise, and fix rules for specific conditions.

Special Bulletin No. 3. *Safety clothing for women in industry.* 1941. 11 pp.

General standards and specific recommendations for protective clothing for specific hazards.

Bulletin No. 184. *The occurrence and prevention of occupational diseases among women, 1935 to 1938.* By Margaret T. Mettert. 1941. 46 pp.

Covers the scope of occupational diseases among women, occurrences, amount of exposure in various industries, and progress in prevention.

Vernon, H. M. *The health and efficiency of munition workers.* London. Oxford University Press. 1940. 138 pp.

Summarizes data from Industrial Health Research Board reports on the effect of hours of work, rest pauses, and various shift schedules upon absences and accidents of men and women workers, and discusses other important factors in the health and productivity of industrial employees.

Personnel Activities Outside the Plant

Great Britain. Ministry of Labour and National Service. *Welfare work outside the factory.* [Cmd. 6310.] London. H. M. Stationery Office. 1941. 15 pp.

Description of the work of the Factory and Welfare Department in the development of welfare facilities for war-workers outside the factories. Discusses the transfer and housing of production workers, daily transportation, recreation, health, and freeing mothers for war work.

Housing and Recreation

Industrial Welfare and Personnel Management (London), December, 1939. "Hostels and clubs for workers," by May Curwen. pp. 469-470.

Reports on the need for hostels evident in a survey of 44 industrial towns, and recommends the inclusion of recreation and writing rooms in dormitories for women and girls.

December, 1941. "Residential hostels." pp. 240-241.

The first of a series of articles describing examples of different types of hostels. This one tells of the arrangements made by two firms for their evacuated office staffs.

Labour Management (London), May, 1941. "Billeting the industrial workers," by D. S. Hodson and Margaret Rowell. pp. 62-64.

Two short discussions of questions involved in providing living accommodations for industrial workers transferred from their homes to work in other areas.

United States Department of Labor, Women's Bureau. *Recreation and housing for women war workers*; a summary of standards, policies, procedures. Washington. February, 1942. 13 pp. and 2 p. bibliography. Mimeographed.

Outlines the needs, suggests community surveys of housing and recreational facilities, and recommends specific standards for rural areas and cities.

Care of Young Children of Working Mothers

Industrial Welfare and Personnel Management (London), December, 1940. "Married women and munition making," by Shena D. Simon. pp. 356-357.

Considers the problems involved in caring for the children of working mothers, and concludes that the question "should be looked at from the point of view of the best use of the woman power of the nation and of the welfare of the children."

Labour Woman (London), February, 1942. "The welfare of the under-fives." pp. 18-19.

March, 1942. "Care of the under-fives." pp. 25, 29.

The former article quotes recommendations of the Standing Joint Committee of Working Women's Organizations, summarizes government circulars on day nurseries, and outlines what has been done. The second article reports opinions expressed at a conference of the Standing Committee, and shows considerable dissatisfaction with progress in schemes for caring for young children.

United Automobile Worker (281 West Grand Boulevard, Detroit), April 1, 1942. "UAW women spur drive for day nurseries." p. 4.

Report of the first meeting of the Wayne County Committee on Day Care for Children.

United States Department of Labor, Children's Bureau. *A community program of day care for children of mothers employed in defense areas.* By Emma O. Lundberg. Washington. December 26, 1941. 24 pp. Mimeographed. (Also printed in *The Child*, January, 1942, pp. 152-161.)

Suggested procedures in determining community needs and developing a program to meet them.

Children bear the promise of a better world—Are we safeguarding those whose mothers work? Defense of Children Series No. 2. 1941. 12 pp.

Lists the duties of mothers who are considering going to work, and the duties of the community to plan for the care and protection of children of working mothers.

"Factors in planning community day-care programs," by Emma O. Lundberg. *The Child,* May, 1942. pp. 281-285.

Further practical discussion of procedures in developing a day-care program.

Report on standards for day care of children of working mothers; submitted by the special committee for Standards and Services authorized by the Children's Bureau Conference on Day Care of Children of Working Mothers. Preliminary report. February, 1942. 22 pp. Mimeographed.

Sources of Current Information

Independent Woman, National Federation of Business and Professional Women's Clubs, 1819 Broadway, New York City. Monthly.

Includes articles dealing generally with the status of women in wartime, and reports particularly on new opportunities in professional fields.

Wage and Hour Reporter, The Bureau of National Affairs, Inc., 2201 M Street, N.W., Washington, D.C. Weekly.

This weekly "Reporter" has included current data on bills introduced and legislation affecting the hours' restrictions and other legal standards for the employment of women.

The Woman Worker, United States Department of Labor, Women's Bureau, Washington, D.C. Monthly.

Contains information on labor market developments affecting women, on labor standards in war industries, on women in unions, and other relevant material. The mimeographed, special reports of the Women's Bureau as well as the regular printed series should also be followed closely by anyone concerned with problems of women in war industries.

Information on developments in women's industrial war work in England is reported in the following government, union, and association publications:

Industrial Welfare and Personnel Management, The Industrial Welfare Society, 14 Hobart Place, Westminster, S. W. 1. London. Monthly.

The Labour Woman, The Labour Party, Transport House, Smith Square, London, S. W. 1. Monthly.

Labour Management, The Institute of Labour Management, Aldwych House, London, W. C. 2. Monthly.

Ministry of Labour Gazette, H. M. Stationery Office, York House, Kingsway, London, W. C. 2. Monthly.

OCCUPATIONS

METAL TRADES - 1943

Decide Women Can Fill Many Jobs in Foundry

Women can safely and efficiently do the work of men in foundries if given adequate training and supervision as well as proper clothing and protective equipment. They therefore should be paid the same wage scale as men.

This is the conclusion reached by the war problems committee of the Wisconsin chapter of the American Foundrymen's association. The committee, headed by William J. MacNeill, president of the Federal Malleable Co. here, has the task of solving foundry war problems that otherwise might seriously retard production.

Because the present critical manpower situation seriously threatens production of war goods, the committee has conducted an extensive study of the possibility of women replacing men in the making of castings.

State Official Heard

"Of necessity industry is forced to accept the fact that women now have to do the work of men in most plants," said Dr. Paul A. Brehm, director of the industrial hygiene division, Wisconsin state board of health, who sat in last week on a committee meeting. "Management will have to change former ideas on this subject. In certain skilled jobs women, who previously were thought to be ineligible, are now producing at a greater rate than men. They take great patriotic pride in their work."

Dr. Brehm declared it was not necessary for women in industry to submit to physical or medical examinations more often than once a year, the same as has been the practice for male workers. However, he cautioned that women should be compelled to promptly inform management of prospective motherhood. Prospective mothers could, with reasonable safety, he said, work through the sixth month of pregnancy while those engaged exclusively at desk jobs could work through the eighth month.

Training Is Urged

Dr. Stewart Scrimshaw, associate dean of the college of business administration, Marquette university, said: "It is not necessary to obtain women to teach such women replacements. Women will accept teaching and training from men if they recognize that the men know their business."

He recommended that women not work over eight hours and that they be compelled to wear proper protective garments, especially for the hair; be given adequate mechanized equipment to make the work as easy as possible, and be provided with satisfactory sanitary facilities and rest rooms. In addition to the customary lunch period, he urged occasional short rest periods, which he believed would improve production.

"Adequate training for women entering industry cannot be too strongly urged," he declared. "While it has been suggested that 15 pounds is the maximum that women should be expected to lift, they frequently are called upon to lift more in ordinary household duties."

List of Jobs

The committee's conclusions after careful surveys were that women cannot be confined to one particular shift, but would have to be distributed throughout the customary three shifts.

The pouring of molten metal, except in cases of hand ladle pouring, where greater strength is required, should not prove more hazardous for women than for men, the committee decided. In mechanized pouring of iron, it was concluded, women would possibly be more alert and thus equally as satisfactory if not in some instances better than men.

It was recommended that women be used as widely as possible in all foundries. Jobs for which women could be employed in the foundries include bench and squeezer molding, with men to carry away the molds; coremaking and the operation of mechanized sand mixers, straightening presses, drop hammers and other mechanized equipment.

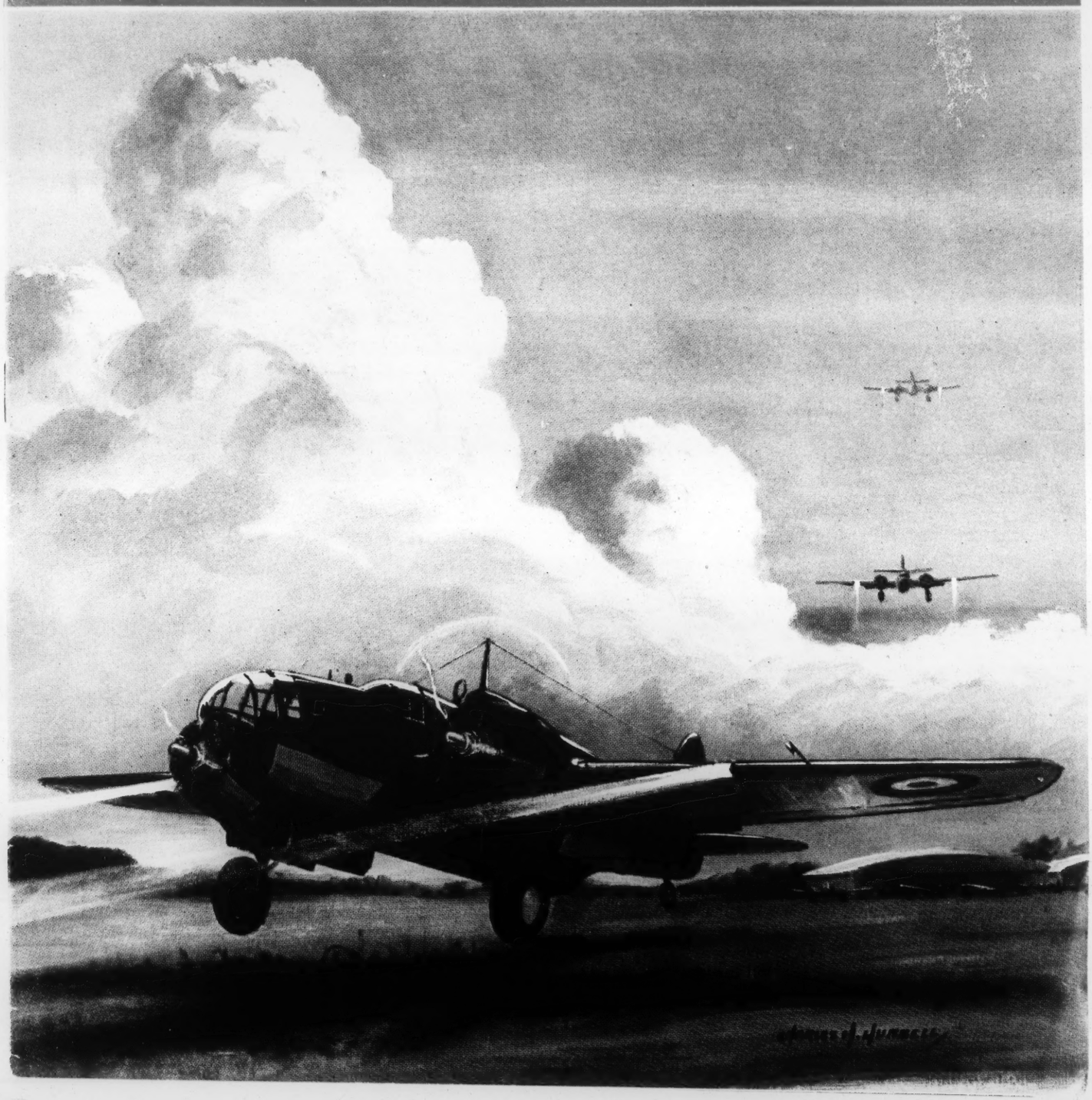
JOURNAL

MILWAUKEE - WISCONSIN

JANUARY 17- 1943

COPPER & BRASS RESEARCH ASSOCIATION Bulletin

NUMBER 124 FEBRUARY, 1943

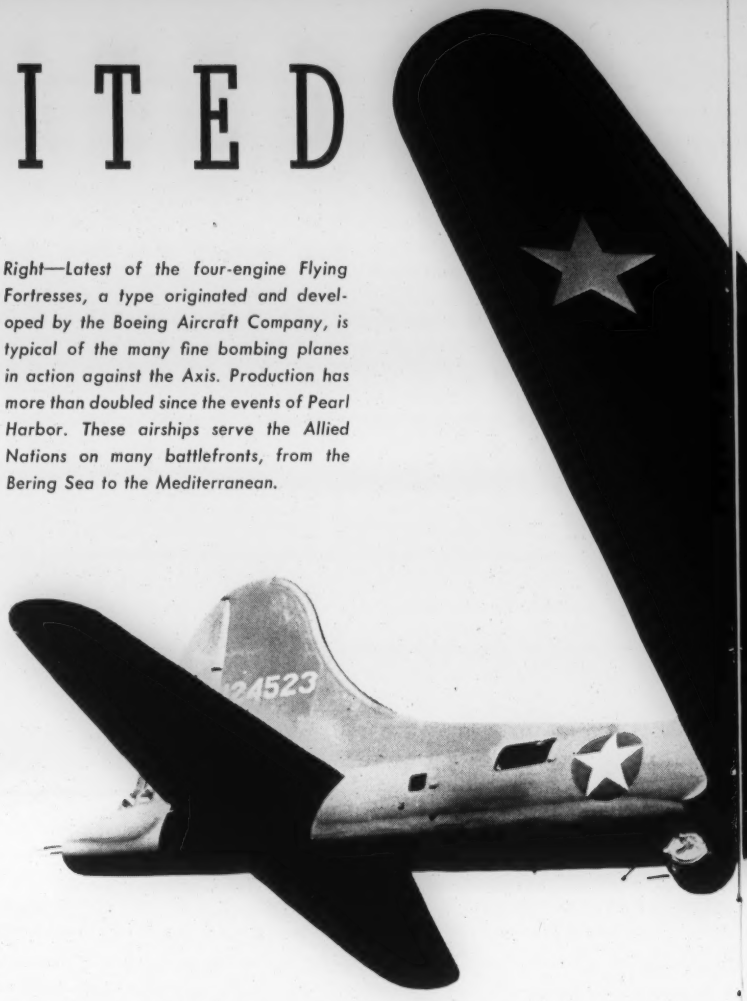


Planes of the UNITED S

When President Roosevelt last year asked for a new military plane every eight minutes the great aircraft companies together with the converted facilities of the automotive industries exceeded that quota. This year the request is for a fighting plane to be turned out every four minutes, and these industries, in the American tradition, will produce more Fighters in the Skies than the President has called for. Some idea of the numbers involved may be obtained from the fact that the United States is now turning out almost four times the number of planes in a single year as have been produced in the 32 years since the Wright brothers delivered the first plane to the United States Signal Corps.

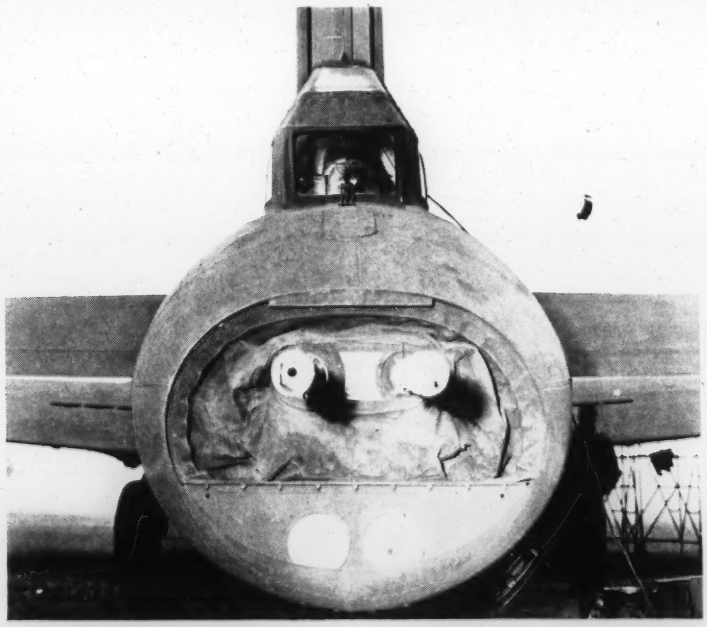
Since the treacherous attack on Pearl Harbor and our entry in World War II, the War for Freedom, American fighting planes have been brilliantly doing their part in battling the Axis for control of the skies over occupied Europe, Russia, Africa and the far reaches of the Southern Pacific Ocean. Many of the successes which are being achieved are the result of the superior qualities of our fighters and battleships of the air, which daily are striking telling blows against the enemies of

Right—Latest of the four-engine Flying Fortresses, a type originated and developed by the Boeing Aircraft Company, is typical of the many fine bombing planes in action against the Axis. Production has more than doubled since the events of Pearl Harbor. These airships serve the Allied Nations on many battlefronts, from the Bering Sea to the Mediterranean.



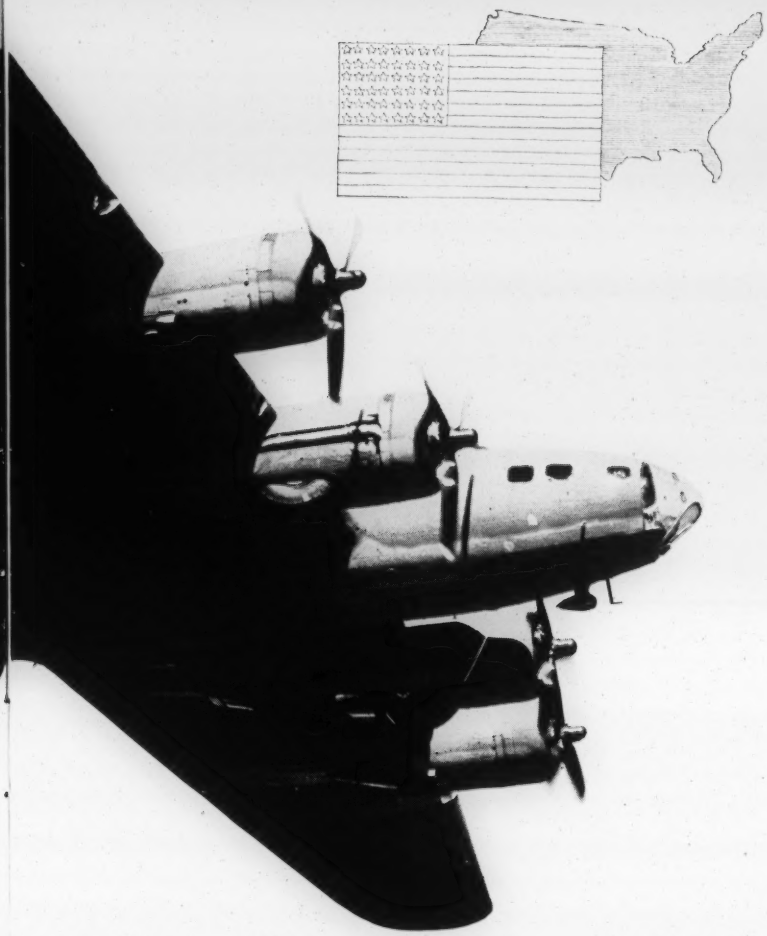
Below—Sitting in the plastic nose of a Boeing Flying Fortress, the bombardier sights the target, and directs the pilot on the bomb run. In the event of contact with enemy craft, the bombardier efficiently uses the machine gun protruding from the gun port. Note the Flying Fortress ahead in clouds. These Sky fighters are blasting the enemy.

Below—During World War I, the tail of a warplane was considered the Achilles heel of a fighting airplane. It was a totally unprotected blind spot. Not so with the modern American bombers, such as the Boeing-B-17 Flying Fortress. The tail of this new plane bristles with two machine guns protruding from what is commonly called the stinger turret, making it a strong offensive weapon.



Cover—Martin Bombers, from a painting by Charles H. Hubbell furnished through the courtesy of the Glenn L. Martin Company.

STATES are fighting on all Fronts . . . .

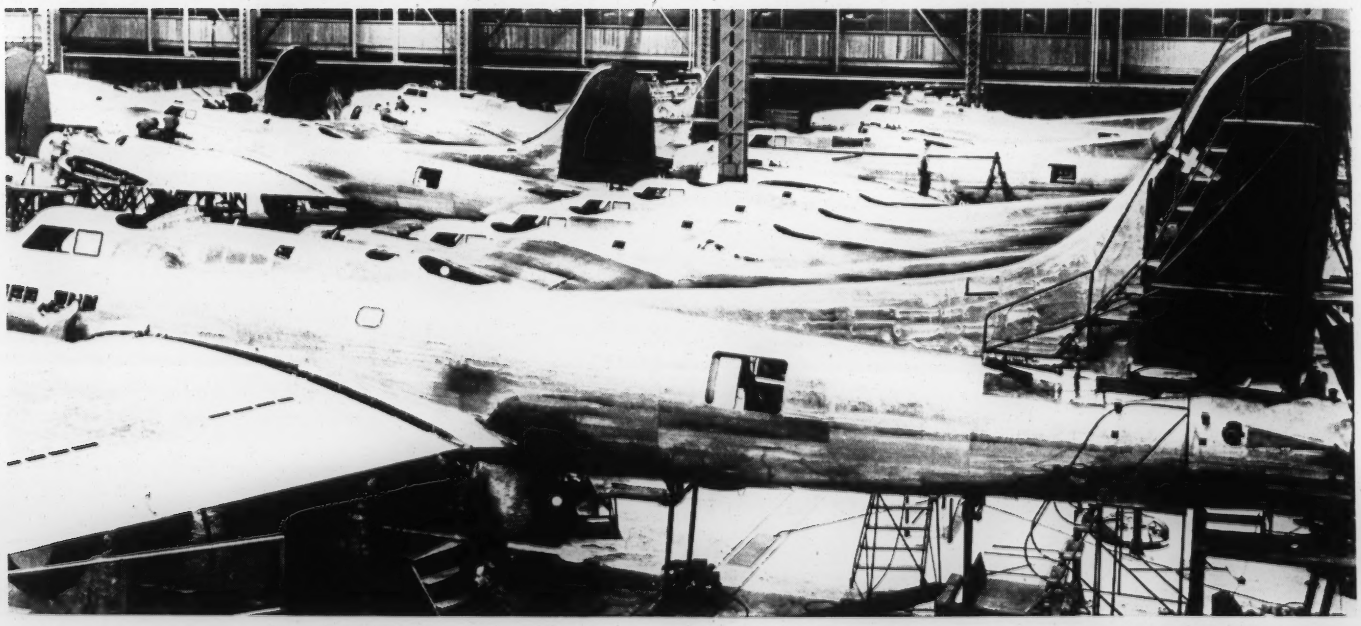


civilization in all quarters of the globe.

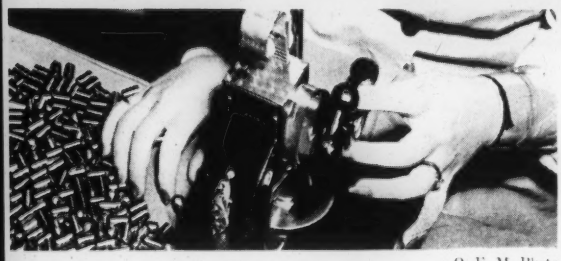
Flying Fortresses, with their high speed, long range and great bomb-carrying capacity, are bringing havoc, death and destruction on all the Axis powers, and give every promise of being the Weapon of Victory. General Arnold, commanding the United States Army Air Force, recently said, "the guts and backbone of our world-wide aerial offensive is the Flying Fortress."

As in all American fighters in the sky, a factor in their superiority over the Nazi Messerschmitts and the Japanese Zeros is their use of Copper and its Alloys—Man's Oldest and Most Useful Metal. Metallurgical developments permit our planes to fly much higher. They sight their targets far in the distance, release their bombs, and, even before the bombs hit the target, the pilot can turn back from the danger zone of anti-aircraft guns. The great Copper mines and Brass fabricating factories of this country are working day and night to supply these essential materials to the manufacturers of our vast aerial fleet. The Copper and Brass Industry is justly proud that these metals, so important in times of peace, are being supplied to keep up with the increasing demands of war.

Below—Here the final assembly of the Flying Fortress is shown. The airplane has been removed from the hydraulic jacks. Next the outboard wings and the tips will be installed. Then the assembly is completed with the installation of seats, gun turrets, and tail enclosures. Soon these ships will be winging their way to join our armies overseas.

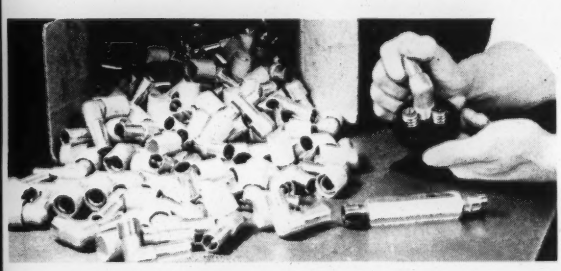


Above—Before the attack on Pearl Harbor this General Motors Division assembly line was turning out thousands of generators, starters and instruments of all sorts. Now it is busy making equipment requiring much Copper and its alloys for use in United States Army and Navy training, combat and bombing planes.

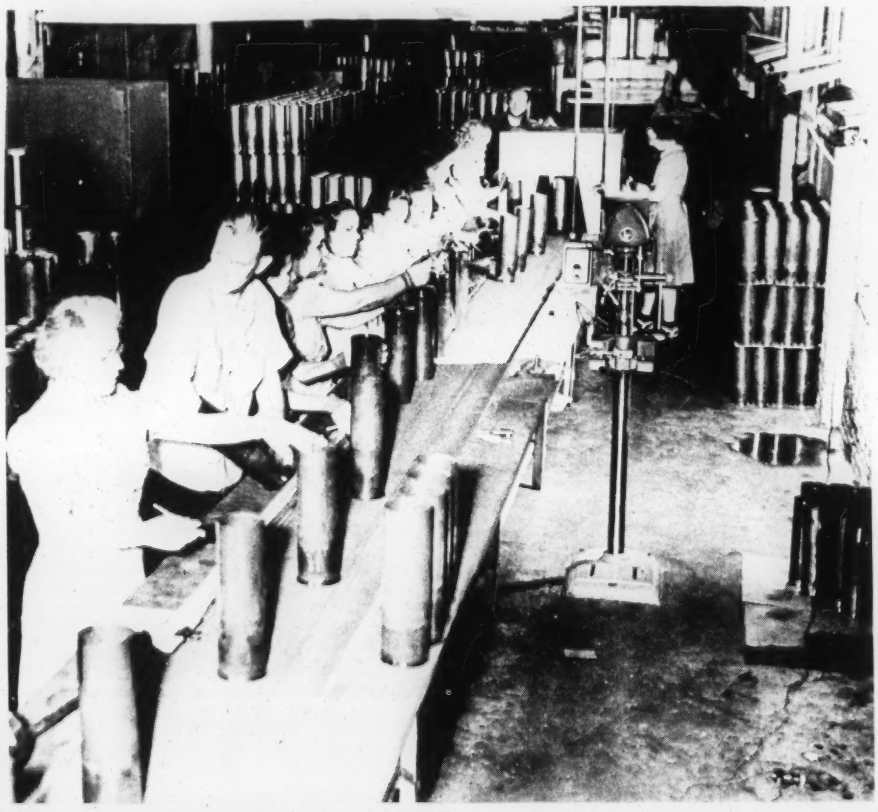


O. E. M. Photo

Above—Sensitive fingers testing push rod ball ends for Cyclone and Whirlwind aircraft engines at a plant of the Wright Aeronautical Corporation.



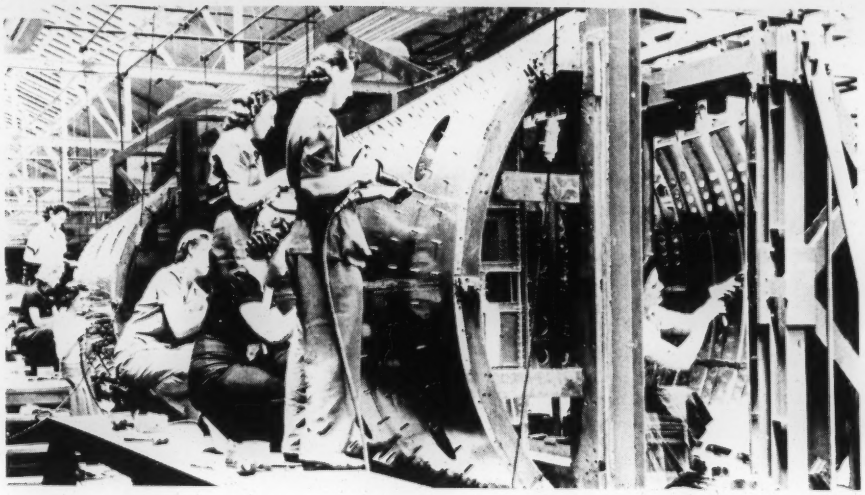
Above—Many types of Brass fittings are used on oil, fuel and hydraulic lines of the Curtiss Kittyhawk, Warhawk, Commando and many others.



Left—Women are found to be very efficient in the operation of lathes in the plants of the Curtiss Wright Corporation. Skillful workers, using good materials, are producing engines and planes second to none.

Above — Brass cartridge case line in operation at the Guide Lamp Division of General Motors Corp. Groups of inspectors working beside conveyors examine every cartridge case before shipment.

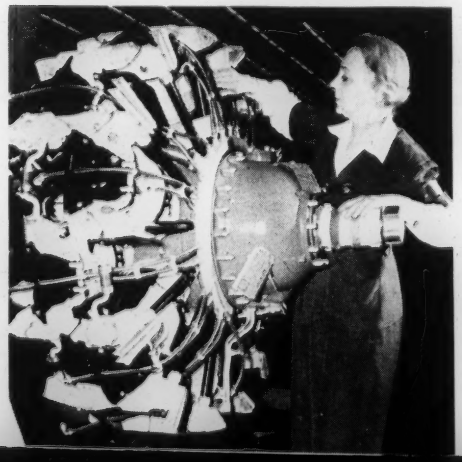
Below left—Women have proved to be good riveters in airplane factories. This young lady is riveting the skin to the fuselage of a plane at a plant of the Douglas Aircraft Company. Center—Another Douglas worker operating a hardness tester. Right—Assembling of parts and adjustments are operations which are done successfully by well-trained, efficient women at Douglas Aircraft plants.



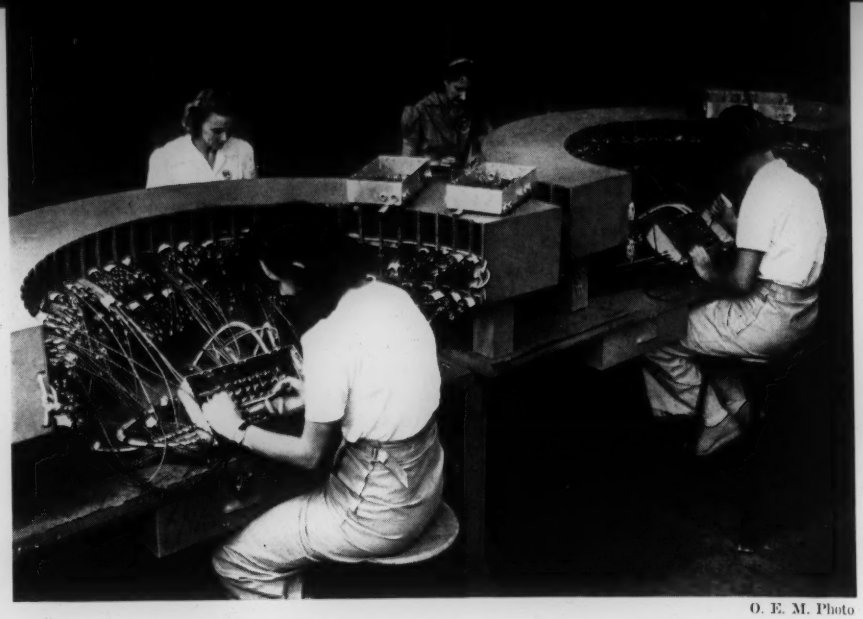
Above—Copper tubing, used in American Aviation B-25 medium bombers, is immersed in a cleaning solution to give it a bright finish as a final step before installation.

Below left—Engine dress-up inspection in a West Coast Aviation plant. This engine is now ready for the plane. Right below—At a Ford Bomber Plant workmen are shown riveting the skin on the upper surface of an outer wing assembly. Tens of thousands of metal parts go into the assembly of these giant bombers.

Above—Women are being trained in Chrysler Corporation's De Soto Bomber Plant to do some of the operations on fuselage assembly work. Here is shown the outer shell of a bomb-bay section being riveted. Parts are made in eight Chrysler plants.



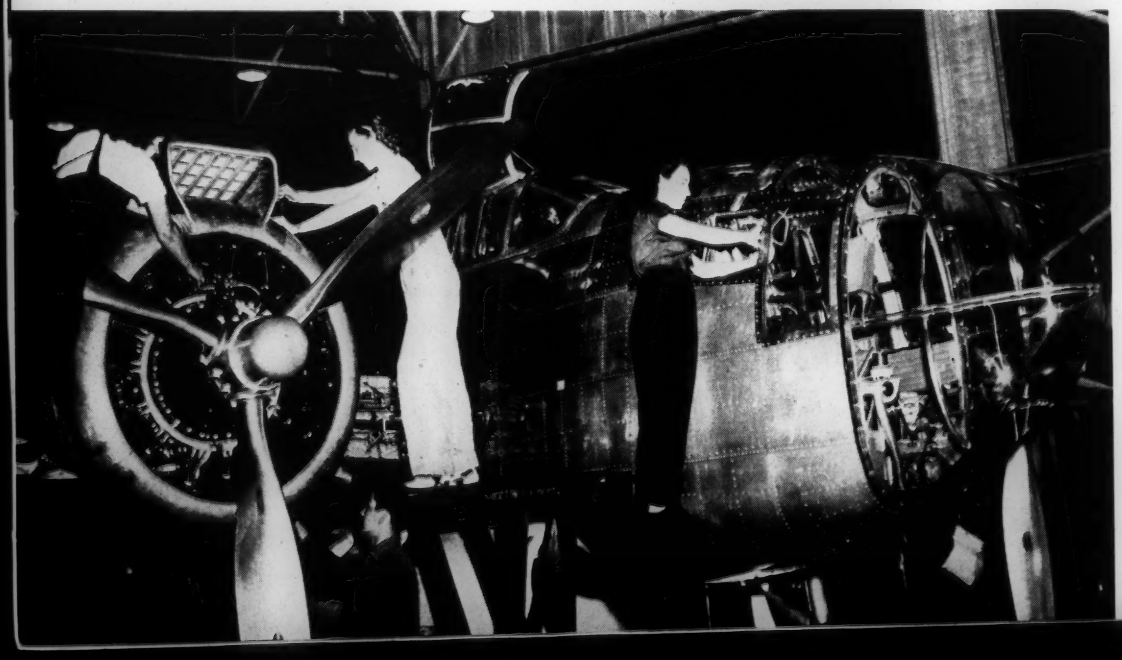
Right—At a Vultee Aircraft plant, girls assemble parts of a basic trainer. The girls in front are soldering electrical attachments and assembling plug fittings. Much of the Copper that is used in the construction of a plane is in electrical equipment.



O. E. M. Photo

Above—Top wages among women employees at Vultee Aircraft go to Mrs. Blanche Patton. Her experience as a welder goes back over a score of years. She has used Copper-alloy welding rod in welding crows nests for battleships in the last war, and has wielded the torch in structural steel work on multi-storied buildings. She is married and she and her husband own their own home near the Vultee plant. "It isn't necessary that I work," Blanche explains. "My husband is an oil field engineer and could well support me, but I feel that I have a skill that can be well used to bring victory closer."

Below left—Dorothy Sellers is an ex-showgirl, who was featured in the "Bicycle Built for Two" act with Billy Rose's Aquacade at the San Francisco World Fair. Employed in the cadmium plating department at Vultee Aircraft, she was formerly a clerk in the Center Wing department of this airplane plant.



Above—Women workers at the Glenn L. Martin plant excel at assembling small parts such as putting Copper terminals on wires and cables. This young lady has been working for the aviation company for over a year, and has acquired great skill.

Left—Final assembly is coveted work on bombers. This exciting stage is now being turned over to women workers. These girls are putting finishing touches on Glenn L. Martin 187 "Baltimore" bombers for Britain. Each plane contains hundreds of pounds of Copper and its alloys.

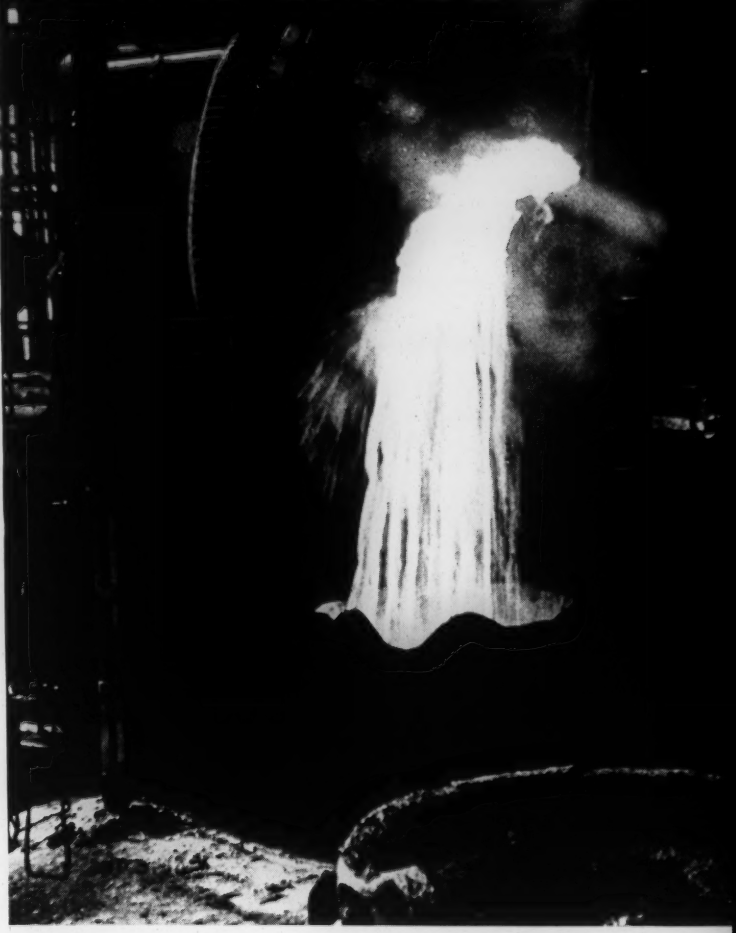
Lend-lease to RUSSIA

Supplies Vast Armies

Russian Forces, greatly assisted by munitions of war sent from the United States and other Allied Nations, have dealt a smashing blow to the Nazi hordes who invaded their country in June, 1941. Not only is the U. S. supplying fighting planes, tanks and other ordnance, but food as well. In addition, millions of pounds of materiel have been sent, with which the factories of the Soviets are working day and night making planes, tanks and ammunition. Russia, itself, is rich in minerals and most of the important metals used in war are found within its boundaries. The ores and metals are found in the Ural Mountains and in the South and Central parts of Siberia and important metallurgical plants for the reduction of the ores are located there. Consequently they are far from the invaded areas and continue to carry on for Victory.

Left—Guerilla decorated with the Order of the Red Star for exemplary execution of orders in fighting the German invaders in the Ruza district of the Moscow region. Guerilla detachments have been highly successful.

Below—Production of artillery shells at one of the Moscow plants. These shells have Copper rotating bands which engage the rifling of the guns, causing the shells to spin, insuring accurate flight.



Above—Pouring Copper from a converter at the newly erected Copper smelting plant on the shores of Lake Balkhash in the Eastern part of Central Asia.

Below—On a Russian front, members of the popular Volunteers Corps line up for assignments. A large proportion of the Volunteers are women.

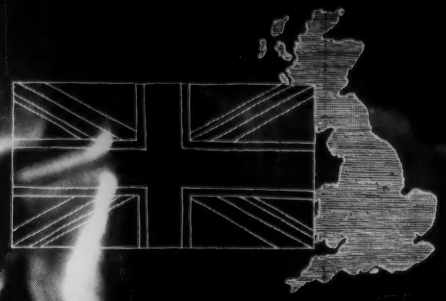
All photos by Sovfoto

More than 8,500,000 of the 17,250,000 British women between the ages of 14 and 65 are doing full-time war-industry work today. The British women are not only doing light work in ammunition factories but are doing fairly heavy work in such industries as Copper refining. They are operating large casting machines, handling 55-pound Copper ingot bars, blanking out anti-tank cartridge case discs and doing other tasks that formerly were done only by men, most of whom have been called to the Colors and are fighting on all fronts in the War for Freedom.

It is difficult for us to realize, in the relative peace and security in which we live, the terrible conditions under which these brave women have been working, threatened day and night by bombing attacks. We can be proud to think of them as allies.

What we know as Selective Service has been extended in Great Britain to the point where the Government has full power to direct any person of any age to perform any service that person is capable of performing. Boys and girls of 16 and 17 have been registered and are being interviewed under arrangements made by a youth service committee of education authorities, who establish direct contact with them through the schools. Those who are not already engaged in full time work are encouraged to join some form of training or national service, such as Boys and Girls Clubs, Young Farmers Clubs, Guides, Scouts or Brigades.

Below—This former British barmaid is shown blanking cartridge discs from Brass strip "somewhere in England." Thousands of British women are doing this kind of work. They are keeping the refineries and Brass mills operating around the clock to help supply the Front Lines.



ENGL

Copper

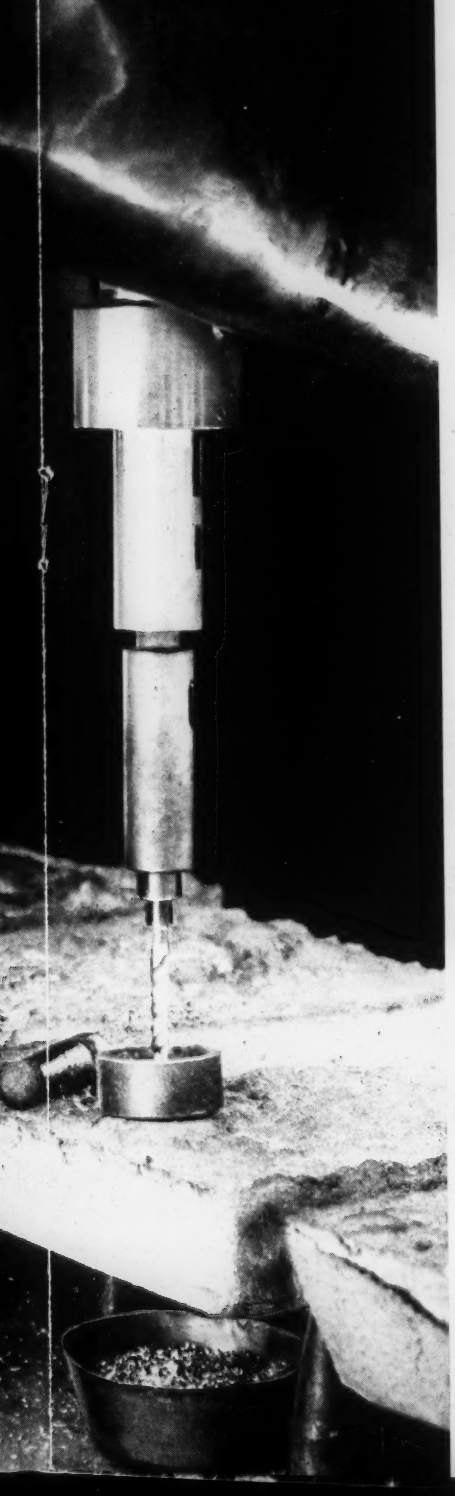
Supply W

This young British girl is shown drilling cakes of blister Copper so a sample can be provided for chemical analysis. By these careful tests, the purity of the finished product is maintained.

LAND'S

r Refineries

War Needs



Above—A busy scene showing women workers engaged in gauging bullets. Millions of such bullets, each set in a Brass cartridge case, are produced in England every month and shipped to all places where the armies of the United Nations are fighting.

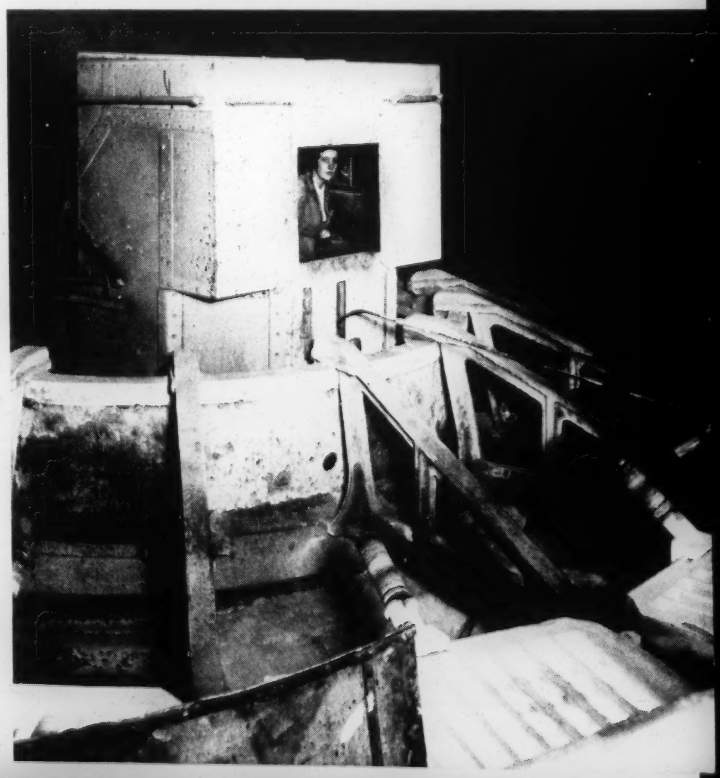
Above—Formerly employed in domestic service, this British girl is now busily engaged in gauging 20 millimeter Brass shell cases for aircraft cannon.

British Official Photographs

Above—Copper Ingot bars, just cast, are being taken off the inspection conveyor and stacked. These women are handling 55 pound bars. The Ingot bars will be sent to the Brass mills for making cartridge Brass.

Below—The British girl operator seems dwarfed in the control cage of the giant casting wheel on which the Copper Ingot bars shown above are being cast. Each mould holds 10 of the 55-pound bars.

Above—Wiring of pilot instruments panel in cockpit. One girl is a G. T. C. trainee, the other was recently transferred from canteen. They are soldering bomb sockets, previously done by skilled men.



War Industries of CANADA near

WIB Photo

Above—Crew from Royal Canadian Regiment set up Bren gun ready for action. This is one of the new and effective weapons which have been developed in this war. Ammunition for these guns is being produced in tremendous quantities.

Below—The steel frame of a sister ship arises on shore as the first launched ship stands at her outfitting berth. Canada's shipbuilding industry is now in high gear. Ships in all stages of construction are being rushed to completion.

Canada with the rest of the British Commonwealth of Nations has given and continues to give everything in its power to help defeat the Axis. Not only has the land of the Maple Leaf sent thousands and thousands of soldiers to every front in this global war, but it is supplying ships and food to England, Russia and others of the United Nations. Great convoys have been leaving from both Atlantic and Pacific ports. Fine transcontinental railroads provide a short cut from Great Britain to the Far East and to the Southern Pacific.

Soldiers and sailors of Canada gave their all in World War I, and the pages of history are emblazoned with their heroic deeds, just as they are in the present World conflict. British and French Canadians are fighting shoulder to shoulder, just as they are working together, both men and women, in the great shipyards, munition plants and airplane factories. This co ordinated effort is helped in a measure by the close ties between the Dominion and her neighbor to the South, the United States. Supplies move almost as freely across the borders of the two countries as be-

Peak...

tween our states or the provinces of Canada. Important in this movement is Copper. The Copper mines of Canada, as well as her Brass fabricating plants and steel mills, are working day and night to supply the men at the front with the munitions they require. Copper and its alloys are widely used in the production of munitions because of their great corrosion-resisting properties and their ability to dissipate heat quickly.

Canada's shipyards, like those of other United Nations, are now constructing more ships in a few months than they did during the entire last war. These ships are being rushed to completion at both Atlantic and Pacific shipyards as well as inland ports. Each day more vessels are slipping off the ways to take their places in convoys to carry supplies to the Allies.

Before the entry of the United States in World War II, hundreds of our boys went to Canada to enlist, and many are still in Canadian service, on land, on sea and in the air. The bond between the two countries was never closer than it is today.

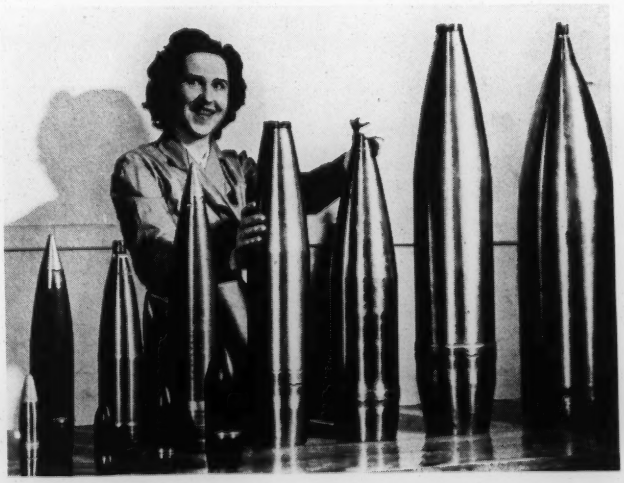
Photos — Public Information

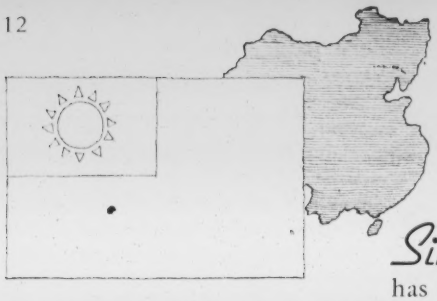
Right—Women had a big share in filling these Bundles for Berlin in a Canadian plant. This girl is tightening nose plugs on 500-pound aerial bombs before shipment overseas.

Left—Milady must be satisfied with lipstick containers made from materials other than Brass. The Brass in the container is enough for the cartridge.

Right — An assortment of projectiles of various calibers showing Copper rotating bands (near the bases) and Brass fuses and detonators. The shells themselves are made of steel.

Left—This illustration shows anti-aircraft shells being fitted with driving bands in a Canadian shell plant. These driving bands are made of Copper or of Gilding metal which is 90 per cent Copper, the balance being zinc.





CHINA'S Manpower

Since 1937 China has been withstanding the hordes of Japanese invaders. Before China was invaded, there were few munitions plants in that country. Today several hundred are making armament, particularly machine guns and small arms ammunition.

The Chinese people responded to the call for Brass and turned in old coins, vases, household utensils which were melted down and ultimately stamped into thick round discs as the first step in making cartridge cases for anti-tank and anti-aircraft shells. These discs are carried in bamboo baskets to the factories where the shells are made.

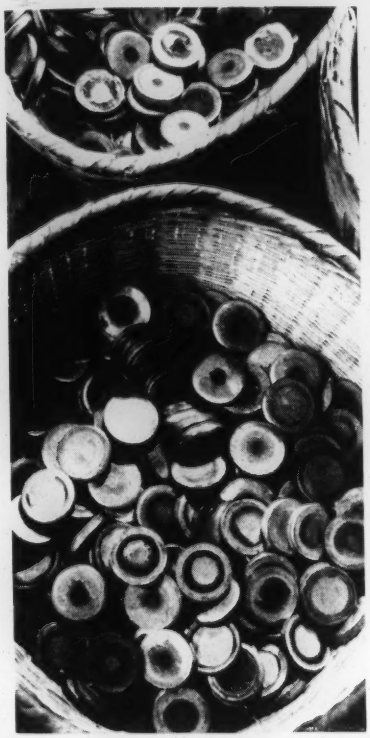
British Dominions, Russia and the United States have, as far as possible, been sending munitions and food into China. This has been supplemented by the equipment which the Chinese, with great resourcefulness and ingenuity, have been producing for themselves. Inspired by the cause for which they are fighting, Chinese men and women are working side by side on the firing line and in the factories which have been laboriously moved into unoccupied territory.

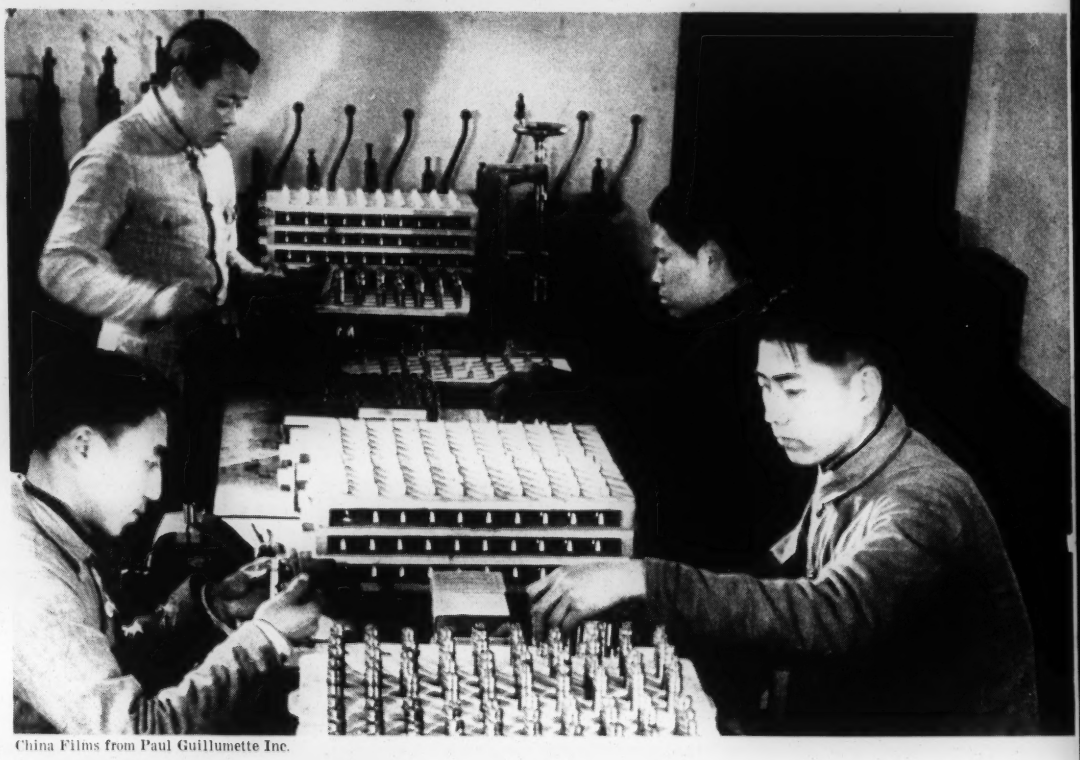
and Resourcefulness proving Effective . . . . . .

Photo by Acme

Left—Girls of Central China are taking their places on the firing line, fighting against the Japanese invasion. Here is a feminine unit's outpost North of Shanghai.

Below — Munitions — Made in China. Special technicians are applying chemicals to mark each type of tracer bullet which they are preparing in this well-lighted corner of a modern factory.



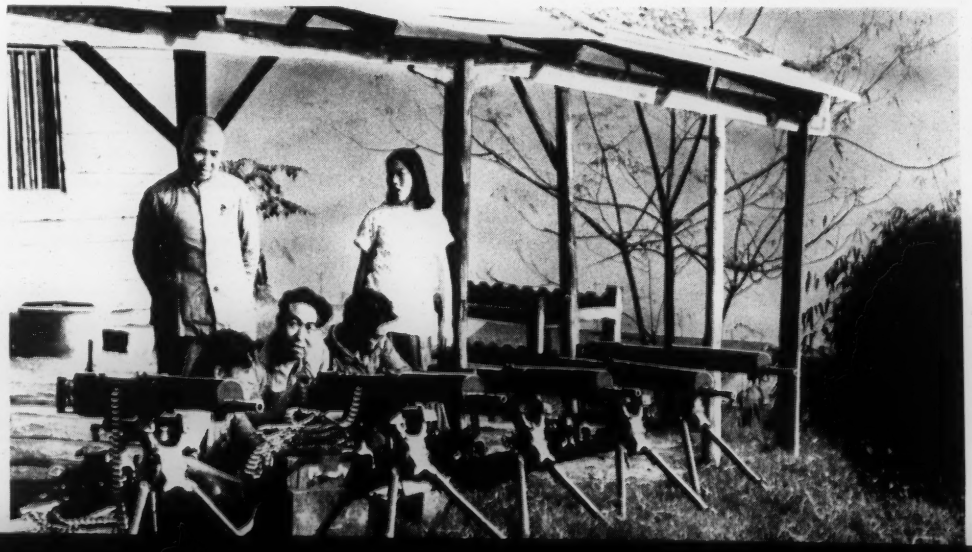


China Films from Paul Guillumette Inc.

Above—Brass, gathered in a salvage drive, is melted down and ultimately stamped out into thick discs as the first step in making shell cases. Bamboo baskets serve instead of a modern assembly conveyor.

Left—Young Chinese girls are using precision instruments made in China to check machine gun parts before they are assembled. People who never saw machinery before are becoming skilled mechanics.

Right—Testing machine guns in China's free West, where these defensive weapons are being forged. There were scarcely any factories in this section before the war.



Qualified women workers test precision gauges made on American machine tools which are playing a big part in Australia's munitions output. They are being used intensively for the manufacture of tools and gauges necessary in Australia's ever increasing output of guns, aeroplane engines, ammunition.

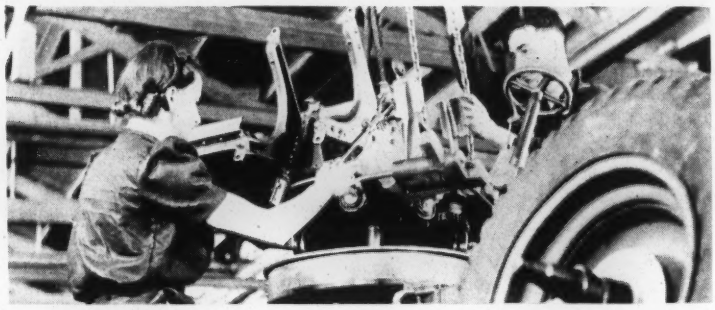
Industries of AUSTRALIA

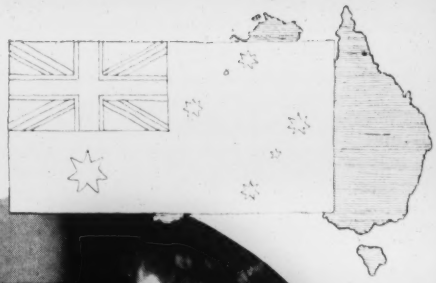
produce much Munitions

Left—Girls riveting the fuselage frame of a Beaufort Torpedo bomber. Preliminary manufacture is done at another factory, and, after being assembled here, the planes go to a third factory for completion.

Center—Lowering ordnance platform onto gun carriage of one of hundreds of 2-pounder anti-tank guns, made entirely in Australia each month. All dies, tools, gauges, jigs and fixtures were prepared in a six month period.

Bottom—Thousands of women are taking their places in Australia's munitions factories. In this factory making Brass shell fuses, a munitionette pauses in her work to take her morning tea.





Below—This girl is examining the enlarged image of a gauge on the screen of a projection machine at a munitions factory.

With Almost every able-bodied man in uniform, women are taking their places in the war armaments plants. Many thousand girls and women are engaged in this kind of work just as efficiently as are the women of England, the United States and other United Nations.

Since Japan's entry into the war Australia has greatly increased the plant and personnel devoted to aircraft production. Beaufort Torpedo Bombers are being turned out in large numbers. In these, as in most other munitions, Copper and its alloys are used for those parts where corrosion-resistance is important. Each month hundreds of two-pounder anti-aircraft guns roll off the assembly line. These guns embody almost 4,000 precision-made component parts, involving 16 major sub-assemblies.

Australia also has a large number of munitions plants producing large quantities of Brass cartridge cases, fuses and small arms ammunition. This war-born munitions industry is a large user of Copper and its alloys, particularly Brass, and much of the Copper is supplied by the mines of the Commonwealth.

MR. & MRS. LESSON IN WAR ECONOMICS *By Arthur Folwell and Ellison Hoover*

[This is a contribution to Victory by Arthur Folwell and Ellison Hoover—Courtesy New York Herald Tribune Syndicate]

Left—Sailors enjoy the entertainment in a lounge of the U. S. O. in San Diego, Cal. The men of the armed services, when off duty, find the recreation centers of this organization ideal for relaxation. The U. S. O. have established club rooms from the Atlantic to the Pacific, from Canada to the Gulf, wherever our soldiers, sailors and marines are stationed.

Right—From all countries of the United Nations as well as from those that have been occupied by the Axis, they are singing the praise of the Red Cross. Angels of mercy are performing heroic deeds behind the fighting lines, administering to the sick and dying, as well as distributing food to those who would otherwise starve. This is a reproduction of a painting entitled "The American Red Cross."

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WOMEN IN INDUSTRY

A Survey Covering

EMPLOYMENT OF WOMEN IN INDUSTRY

1943

Prepared by

Edward J. Kunze
Industrial Engineer, N. M. T. A.

Adopted and Approved by

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PART I

STATISTICAL SUMMARY

Number of plants surveyed which employ women	62
Total number of employes in these plants	221,439
Total number of women employed in these plants	65,527
Percentage of women employment	31
Range of total persons employed per plant	84-42,000
Range of women employment per plant	11-12,624
Number of plants in which employment of women is a normal procedure	32
Number of plants employing women since emergency	30

		No. of Plants
LENGTH OF PERIOD IN WHICH COMPANIES EMPLOYED WOMEN IN THEIR PLANTS	One year or under	21
	1 to 5 years	9
	5 to 10 years	2
	10 to 20 years	5
	20 to 30 years	10
	30 to 40 years	4
	40 to 50 years	4
	50 to 60 years	4
	60 to 70 years	1
	Over 70 years	2
USE OF UNIFORMS	Number of plants in which uniforms were required for women	26
	Number of plants requiring no such uniforms	36
	Of the latter, their use is recommended by	10
	Style and color of uniform designated by	22
	Plants permitting employe to chose her own style	14
	Plants in which worker pays for uniform	24
	Plants paying for uniforms	8
	Plants in which cost of uniform is shared equally	4
	Plants paying for laundering of uniforms	5
	Plants in which employe pays for laundering	32
	Prices of uniforms vary from $2.00 to $6.50.	
	Average cost of uniforms $3.26.	
SUPERVISION OF WOMEN	Plants in which men only are used as supervisors	49
	Plants in which both men and women are used as supervisors	12
	No preference	1
USE OF WOMEN COUNSELORS	Plants employing a woman as counselor	45
	Plants employing no woman as counselor	15
	Plants contemplating employment of counselors	2

			No. of Plants
AGE REQUIREMENTS	MINIMUM	Plants requiring a minimum of 18 years of age	41
		Plants requiring a minimum of from 16 to 18 years of age	15
		Plants requiring a minimum of from 19 to 25 years of age	6
	MAXIMUM	Plants having no maximum age limit	38
		Plants setting an age limit at from 45 to 50 years of age	7
		Plants setting an age limit at from 50 to 60 years of age	9
		Plants setting an age limit at from 45 or under	8
PHYSICAL EXAMINATION		Plants requiring no physical examination	13
		Plants requiring a casual examination	6
		Plants requiring a normal physical examination	24
		Plants requiring thorough physical examination	19
UNION AFFILIATION		Plants having no union contract	24
		Plants having independent unions	9
		Plants in which the International Association of Machinists is organized	1
		Plants in which C. I. O. is organized	19
		Plants in which A. F. of L. is organized	8
		Plants in which both C. I. O. and A. F. of L. are organized	1
HOURS OF WORK	PER DAY	8	39
		7½	11
		8½	2
		9	3
		10	3
		8— 9	1
		8—10	3
	PER WEEK	48	31
		40	3
		44	2
		45	12
		47	1
		47½	1
		54	6
		55	1
		40—54	5
SHIFTS ON WHICH WOMEN WORK		1 shift only	11
		2 shifts	12
		3 shifts	35
		1, 2 and 3 shifts in different departments	2
		2 and 3 shifts in different departments	2

				No. of Plants
ROTATION OF SHIFTS	No rotation			40
	*Rotate			10
	*Rotate in some departments			2
	*Note: Period of shift change varies from 2 weeks used by 5 plants, to 6 weeks used by 2 plants.			
PREMIUM PAID FOR SHIFT WORK	*2d Shift*	*3d Shift*	*Both Shifts*	
			5%	4
			10%	4
			12½%	1
			5c hr.	2
			Lunch	1
			½ hr.	1
			¾ hr.	1
	5%			5
	5c an hour			1
	Lunch time plus ½ hour			1
	11%	20%		1
	2c an hour	3c an hour		1
	3c an hour	5c an hour		2
	5c an hour	8c an hour		1
	6c an hour	1½ hours		1
	½ an hour	¾ an hour		1
		Allow no premium		22
		Have only 1 shift		11
BASIS OF WAGE PAYMENT	Day work			23
	Incentive			8
	Both			26
	Day and group bonus			5
WAGE DIFFERENTIALS ON BASIS OF SEX	Initial pay differential ranged from 3 cents to 32½ cents, the average being 10 cents.			
	After probationary period women receive from 3 to 27½ cents an hour less than men, the average being 11 cents.			
	Periods of probation varied from 30 to 260 days, the average being 51 days.			
	Increase in pay for women at the end of the probationary period ranged from 3 to 15 cents, the average being 6 cents.			
	Plants reporting no difference in initial pay			30
	Plants reporting no difference after probationary period			34

			No. of Plants
DIFFERENCE IN EXPERIENCE ON	ABSEN-TEEISM	No difference than experience with men	19
		Women greater percentage than men	22
		Women lesser percentage than men	13
		No comments or records	8
	TURN-OVER	No difference than experience with men	20
		Greater turnover in women than men	8
		Lesser turnover in women than men	10
		No comment or records	24
PRINCIPAL SOURCE OF RECRUIT-MENT		Personal application	21
		U. S. E. S.	19
		Advertising	9
		Employes	9
		Private agencies	1
		Other sources	3
EMPLOY-MENT TESTS		*Type of Test*	
		Intelligence	5
		Dexterity and manual	1
		Aptitude	12
		Test required	18
ATTITUDE TOWARD EMPLOYMENT OF MARRIED WOMEN		No discrimination	52
		Favorable	7
		No comment	3
REST PERIODS FOR WOMEN	OCCUR-RENCE	Have them	31
		Have 2 per work period	19
		Had but dropped	1
	LENGTH OF TIME	Under 10 minutes	3
		10 minute rest periods	10
		12 minute rest periods	2
		15 minute rest periods	14
		18 minute rest periods	2
		30 minute rest periods	2
		Plants having no rest periods	29

		No. of Plants
FACILITIES FOR WOMEN DURING REST PERIOD	Separate rest room	45
	Cafeteria or lunch room	2
	Washroom	5
	Locker rooms	2
	Corridors	1
	First aid room or dispensary	3
	None	1
SMOKING	Plants permitting smoking while working	8
	Plants having definite smoking periods	12
	Plant permitting smoking at any time in washroom	1
FEEDING SERVICE	*Type*	
	Cafeterias	33
	Canteens or stands	4
	Carts or vending machines	3
	Errand boy	1
	Separate room	41
	Lunch periods range from 20 minutes to one hour.	
COMMENTS OF EMPLOYERS ON EFFECT OF EMPLOYMENT OF WOMEN ON — PRODUCTION	Good	22
	No change	38
	Bad	2
OFFERING SUGGESTIONS	Yes	13
	Seldom	16
	No	32
	Same as men	2
EFFICIENCY	High	40
	Medium	20
	Too new to estimate	2
DISCIPLINE	None	35
	Some	10
	Nothing serious	17

		No. of Plants
TRAINING	Vestibule school	15
	Shop school	7
	Both vestibule and shop schools	7
	Neither vestibule nor shop schools	33
	Cooperate with outside schools only	15
	Cooperate and have own school	10
	Do not cooperate with outside schools	37
SAFETY	Plants having safety organization	60
	Plants that have no special safety organization	2
	Plants have staffs or council (one just starting)	22
	Plants that have workers safety committee (one contemplated)	45
	Plants that have periodical safety inspections	25
FIRST AID OR MEDICAL FACILITIES	Plants having hospitals	7
	Plants having first aid room or dispensaries	52
	First aid rooms casually equipped	17
	First aid rooms adequately equipped	8
	First aid rooms fully equipped	37
	First aid rooms not provided for	2
	Nurse in charge	51
	Physician in charge	2
	Other person in charge	8
	Nobody in charge	1
	Registered nurse in attendance at all times	39
	Other person in attendance at all times	18
	Registered nurse in attendance part of time	5
	Physicians—full time	13
	Physicians—part time	10
	Physicians—on call time	35
	Contemplating training a physician	1
	Have no physician	3
HOUSE-KEEPING INSPECTION	Plants having regular inspections	54
	Periods range from once a day to once a month.	

PART II

TYPES OF WORK IN WHICH WOMEN ARE USED

Women excel in types of work requiring nimbleness of handling such as, light inspection and assembly work and in repetitive work. The following table indicates the types of work in which women are engaged in the plants reporting in this survey. In this table three plant location areas are indicated for each of the three categories of work: heavy, medium and light. The areas are New England, including the states of Connecticut and Rhode Island; North Atlantic, including New York and Pennsylvania; and North Central, including Michigan, Ohio, Indiana, and Illinois.

NOTE: o—No women used on the occupation involved.
x—Women are used on the occupation involved.
H—Heavy work.
M—Medium work.
L—Light work.

OCCURRENCE AS REPORTED BY AREA

Occupation	New England			North Atlantic			North Central		
	H	M	L	H	M	L	H	M	L
Assembler—Rough	o	x	x	o	x	x	o	x	x
Assembler—Precision	o	x	x	o	x	x	o	x	x
Assembler—Complete Machines	o	o	o	x	x	x	o	x	x
Bench Worker	o	o	x	o	x	x	o	x	x
Bindery Worker	o	o	o	o	o	x	o	o	x
Blacksmith	o	o	o	o	o	o	o	o	o
Boring Machine—Horizontal—Set Up and Operate	o	o	o	o	o	o	o	o	o
Boring Machine—Horizontal—Operate Only	o	o	o	o	o	o	x	o	o
Boring Machine Operator—Vertical—Set Up and Operate	o	o	o	o	o	o	o	o	o
Boring Machine Operator—Vertical—Operate Only	o	o	o	o	o	o	x	o	x
Boromatic Operator	o	x	o	o	o	o	o	o	o
Braiding Machine—Set Up and Operate	o	o	o	o	o	o	o	o	x
Broaching Machine	o	o	o	o	o	o	o	o	x
Burner—Flame Cutting	o	o	o	o	x	x	o	o	o
Chemist	o	o	o	o	o	o	o	o	x
Chucker	x	o	x	o	o	o	o	o	o
Coremaker	o	o	o	o	o	x	o	o	x
Crane Operator	o	o	o	o	o	o	x	x	x
Cutting Off Operator	o	x	o	o	x	o	o	o	o
Draftsman	o	o	x	o	o	x	o	o	x
Drill Press—Set Up and Operate	o	x	x	o	o	o	x	x	x
Drill Press—Operate Only	o	o	x	o	x	x	o	x	x
Drill—Sensitive—Set Up and Operate	o	x	o	o	o	o	o	o	x

Occupation	New England			North Atlantic			North Central		
	H	M	L	H	M	L	H	M	L
Drill—Sensitive—Operate Only	o	o	o	o	o	o	o	o	x
Electroplater	o	o	o	o	o	o	o	o	x
Electroplater Helper	o	o	o	o	x	x	o	o	x
Elevator Operator	o	o	x	o	o	o	o	o	o
Etcher	o	o	x	o	o	o	o	o	o
Expediter	o	o	x	o	o	o	o	o	x
Facing Machine Operator	o	o	o	o	o	x	o	o	o
Filer and Burrer	o	o	x	o	x	x	o	o	x
Forge Hammer Operator—Power Driven	o	o	o	o	o	o	o	o	o
Forge Hammer Helper	o	o	o	o	o	o	o	o	o
Foundry Instrument Attendant	o	o	o	o	o	o	o	o	x
Gear Cutter and Hobber—Set Up and Operate	o	o	o	o	o	o	o	x	x
Gear Cutter and Hobber—Operate Only	x	x	x	o	o	o	o	o	x
Greaser and Wrapper	o	x	x	o	o	o	o	o	o
Grinder—Cutting Tool	o	o	o	o	o	x	o	x	x
Grinder—Centerless	o	o	x	o	x	o	o	o	o
Grinder—Drill	o	o	o	o	x	x	o	o	x
Grinder—External—Set Up and Operate	o	x	o	o	o	o	o	o	x
Grinder—External—Operate Only	o	x	x	o	o	o	o	o	o
Grinder—Internal—Set Up and Operate	o	o	x	o	o	o	o	o	x
Grinder—Internal—Operate Only	o	x	o	o	o	o	o	o	x
Grinder—Milling Cutter	o	o	x	o	x	x	o	x	x
Grinder—Rough—Set Up and Operate	o	o	o	o	o	o	o	o	o
Grinder—Rough—Operate Only	o	o	x	o	x	x	o	x	x
Grinder—Surface—Set Up and Operate	o	o	o	o	o	o	o	o	x
Grinder—Surface—Operate Only	o	x	x	o	x	o	o	o	x
Grinder—Universal Tool	o	o	x	o	x	o	o	x	x
Guard	o	o	x	o	o	o	o	o	x
Heat Treater	o	o	x	o	o	o	o	o	o
Heat Treatment Attendant	o	o	x	o	o	o	o	x	o
Helper—General	o	x	o	o	x	o	o	x	o
Inspector—Complete Machines or Units	o	x	x	o	x	x	o	x	x
Inspector—Parts	o	x	x	o	x	x	o	x	x
Insulator	o	o	o	o	o	o	o	x	x
Janitress	o	o	x	o	x	x	o	x	x
Lathe—Bench—Set Up and Operate	o	o	x	o	o	o	o	o	x
Lathe—Bench—Operate Only	o	o	x	o	o	x	o	x	x
Lathe—Engine—Set Up and Operate	o	x	x	o	o	x	o	x	x
Lathe—Engine—Operate Only	o	x	x	o	x	o	o	x	o
Lathe—Speed—Set Up and Operate	o	o	o	o	o	o	o	x	x
Lathe—Speed—Operate Only	o	o	o	o	o	o	o	x	x
Lathe—Turret—Set Up and Operate	o	o	o	o	x	o	o	o	o
Lathe—Turret—Operate Only	o	x	x	o	x	x	o	x	x
Lapping Machine Operator	o	x	o	o	o	o	o	o	o
Layout Worker	o	o	o	o	x	x	o	o	o
Mill—Hollow Operator	o	o	o	o	o	o	o	x	o
Milling Machine—Set Up and Operate	o	x	x	o	x	x	o	x	x
Milling Machine—Operate Only	o	o	x	o	x	x	o	x	x
Milling Machine—Bench—Set Up and Operate	o	o	x	o	o	o	o	o	x
Milling Machine—Bench—Operate Only	o	o	x	o	o	x	o	x	x
Molder—Bench	o	o	o	o	o	o	o	o	o
Molder—Floor	o	o	o	o	o	o	o	o	o

Occupation	New England			North Atlantic			North Central		
	H	M	L	H	M	L	H	M	L
Molder—Machine	o	o	o	o	o	o	o	o	o
Molder—Squeezer	o	o	o	o	o	o	o	o	o
Packer	o	o	x	o	o	x	o	x	x
Painter and Sprayer	o	o	o	o	x	x	o	x	x
Paint Department Helper	o	o	o	o	o	x	o	o	o
Paper Folding Machine Operator	o	o	o	o	o	o	o	x	o
Planer—Set Up and Operate	o	o	o	o	o	o	o	o	o
Planer—Operate Only	o	o	o	o	x	o	o	x	o
Polisher and Buffer	o	x	o	o	o	x	o	x	x
Press Operator—Bench	o	o	o	o	o	o	o	o	x
Press Operator—Kick	o	o	o	o	o	o	o	x	x
Punch Press—Set Up and Operate	o	o	o	o	o	o	o	o	o
Punch Press—Operate Only	o	o	x	o	x	x	x	x	x
Radial Drill—Set Up and Operate	o	o	o	o	x	o	o	o	o
Radial Drill—Operate Only	o	o	o	o	o	o	x	x	o
Riveter	o	o	o	o	o	x	o	x	x
Rivet Bucker	o	o	o	o	o	o	o	o	o
Rivet Heater	o	o	o	o	o	o	o	o	o
Screw Machine—Automatic—Set Up and Operate	o	o	x	o	o	o	o	o	x
Screw Machine—Automatic—Operate Only	o	o	x	o	o	o	o	x	x
Screw Machine—Hand—Set Up and Operate	o	o	o	o	o	o	o	o	o
Screw Machine—Hand—Operate Only	o	x	x	o	o	o	o	x	x
Shaper Operator	o	o	o	o	x	x	o	o	o
Shear Operator	o	o	o	o	o	o	o	x	o
Sheet Metal Worker	o	o	o	o	o	o	o	o	o
Solderer	o	o	o	o	o	x	o	o	x
Sorter	o	o	o	o	o	o	o	o	x
Splining Machine Operator	o	x	o	o	o	o	o	o	o
Temperer—Torch and Lead	o	o	x	o	o	o	o	o	o
Templet Maker	o	o	o	o	o	x	o	o	o
Tester	o	o	x	o	x	x	o	x	x
Threading Machine Operator	o	o	o	o	o	x	o	x	o
Toolroom and Stockroom Attendant	o	o	o	o	o	x	o	o	x
Truck Driver (Motor Truck)	o	o	o	o	o	o	o	o	x
Truck Operator (Within Plant)	o	o	x	o	o	o	o	o	x
Winder—Close Requirement	o	o	o	o	o	o	x	x	o
Winder—Hand and Semi-Automatic Armature	o	o	o	o	o	o	o	x	o
Winder—Simple Winding	o	o	o	o	o	o	o	x	x
Welder—Arc and Gas	o	x	x	o	x	x	x	x	x
Welder—Spot	x	o	o	o	o	x	o	x	x
Wire Forming Machine Operator	o	o	x	o	o	o	o	o	x
Wirer and Taper	o	o	o	o	o	o	o	o	x

PART III

ANALYSIS OF FACTORS GOVERNING EMPLOYMENT OF WOMEN

Opinions Reversed Regarding Woman Employment

Until a year ago, most companies questioned the feasibility of employing women to operate machines and were putting off, as long as possible, their employment on production jobs with fear and trepidation. Today many of these companies are praising, enthusiastically, the efficiency of women in such employment where in some cases they have even excelled the efficiency of men whom they have displaced. It was thought that women were not suited for work in a wide variety of types, some of which appeared too dirty for them. It has been found, however, that women have a faculty of making dirty jobs cleaner.

The United States Employment Service recently surveyed 1959 occupations in 21 key war industries and 937 occupations in non-war industries where there is now an active labor demand and found that women could perform 80 per cent of the war industry jobs although only 8.5 per cent of them, at the time, were performed by women.

Characteristic Differences, Factor in Successful Employment of Women

Women are different than men hence, if they are to be employed to best advantage, their characteristic differences should be examined and provided for so far as it is possible to do so, before dissatisfaction and disgruntlement take root.

Women in general are not considered by some employers to be as stable emotionally as men. They are more sensitive to criticism, feel things more keenly, are more easily discouraged and more likely to become emotionally disturbed than men. They are more critical of each other than are men. As a rule, women are less personally ambitious regarding their jobs than men due very likely to the fact that they do not look upon the jobs as permanent. Women are more patient, industrious, painstaking and efficient about doing the same thing over and over again; accepting routine work more graciously than do men. They are more careful with details. Their patience prevents them from becoming irritable due to monotony especially when refreshed by suitable rest periods.

Once their domestic problems are solved, women stand the routine, grime and noise of factories as well as or even better than men. Factory noises bother

some women when they are new to factory work, but soon they find them less nerve racking than irritable babies. Women, however, are sensitive to dirt, unpleasant odors and lack of good housekeeping. They are more fastidious about their personal appearance. They tire faster and are said to be more adversely affected by heat and toxic fumes than are men although this is denied by some physicians. It may be that restrictions in their occupations are due to women's ability to become genuinely sick because of some emotional objection to her occupation. It is generally assumed that women have little more than one-half the strength of men, perhaps this is due to lack of necessity, heretofore, to do laborious work. Russian women do as heavy work as do men.

Women's physical structure, however, is radically different from that of men; their muscular development is unlike that of men hence their staying powers at hard physical labor are limited relatively. While women are usually shorter in stature than men, proportionately their torsos are longer hence their legs are shorter proportionately than those of men, thus work benches, chairs and shelves should be designed to fit the average woman's physique. Shorter arm length calls for shorter levers on machines. Women's Bureau Labor Bulletin No. 189-1 gives the average woman's physical strength as 57% that of man and her resistance 67.9% that of man.

Women have a competitive spirit which causes them to desire to make a showing when placed in a new situation, which takes the nature of a flair. This has caused them, in many instances, to exceed the efficiency of the men they displace. Their sensitiveness of touch and deep concern in their work cause them to break less small drills than are broken by men. In a like manner they are well fitted to do both hand and machine tapping. If we face these facts and use them intelligently, much trouble, which may be difficult to overcome, will be avoided.

Prior Provisions Should Be Made Before Women Are Employed

For successful selection of women for war-industry jobs the Women's Bureau of the U. S. Department of Labor, Special Bulletin No. 12, March, 1943, recommends:

"1. Prior to selecting women for the jobs, a careful analysis of the plant should be made to determine:

   a. Which jobs are suitable for women.

   b. Which jobs can be made suitable for women.

   c. What changes are necessary in conditions surrounding the job, as for example, in height of seats or benches, in weight of machine

parts or of products to be handled, in installation of mechanical lifts and so forth.

"2. The persons who are to select women should have the following qualifications:

a. Detailed knowledge of the jobs to be filled and of conditions in the plant.

b. General knowledge of the types of work for which women ordinarily are fitted.

c. Interest in women and belief in their capabilities.

d. Competence in interpreting such tests as may be used in selecting women.

e. Freedom from personal prejudices and ability to inspire confidence in the job seeker.

"3. The procedure for selecting women should be carefully planned in advance and may well include:

a. Provision of simple and adequate application blanks.

b. A series of interviews, with purposes as here described.

c. Tests rigidly tailored to fit the specific job."

Previous to taking women into the factory, there should be full consultation with foremen and other factory supervisors so as to avoid internal friction.

*Before the women workers were actually brought into the factory, one company employed a mature woman with a considerable experience in business and put her on many types of machines from department to department to see if women could operate such machines. This not only convinced the management, but gave this woman such an understanding of the whole problem of woman employment that she was made supervisor of women, counselling with them on all personal and policy problems. This proved highly satisfactory.

We have enumerated some of what has been indicated as such characteristics of women which affect their employment on production work in industry. Of course, there are numerous exceptions. Some women have a ruthless ambition that would make even Adolph Schikelgruber blush for shame if he could blush and if he had any shame. Many are strong enough to do heavy work. If women remain on the production line for a number of years, there is little doubt that many of the characteristics enumerated above will be changed radically. They have been brought out here merely as a guide to those who are introducing the employment of women in their factories.

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*Iron Age, November 5, 1942, page 59.

Operating Conditions Must Be Adapted

Re-engineering required to accommodate women workers involves equipment of special safety devices, re-adjustment of machine parts to suit the physiological structure of women, provision of additional sanitary facilities, rest rooms, etc., and possible breaking down of present operations so that women may take over that part of the operation best suited to them or installation of mechanical handling devices such as hoists, cranes and conveyor systems. *Except for very slight injuries such as scratches, "more women are injured in machinery accidents than in any other way." "Machine guards," for example, "should be set close enough that women's smaller hands cannot enter the openings."

Instead of having benches made lower to suit the shorter leg length, platforms, perhaps of various heights, may be supplied. Foot pedals and levers should be made shorter. Placement of materials in process so they are in convenient reach and use of long tables which enable the worker to push the material in process rather than lift it from one table to another, add to the effectiveness of working. Studies should be made in routing to lessen the amount of movement necessary and reduce the space required. The Women's Bureau of the Department of Labor makes the following statement from a New York study made in 1921:

"1. Providing chairs and tables increased production in a rubber factory so that 16 girls performed as much work as 20 had done before.

"2. A foot pedal operator who has to strain unduly to reach the pedal, suffers from pelvic congestion with resulting harm to the pelvic organs.

"3. Addition of satisfactory foot rests and foot pedals in an electric supply factory eliminated much fatigue."

Reduction in size of tote boxes so that pan and contents weigh no more than 35 pounds should be made if women are to handle them. Most states have laws limiting the weight women may be required to lift.

By-Products of Woman Employment

By-products of the employment of women in factories, some of which will benefit men as well as women, consist in:

1. Establishment of better lightng, heating, sanitary and similar conveniences.
2. More pleasant surroundings and better housekeeping.
3. Greater provision for safety.
4. Increase in conveniences for handling materials in process.

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*Safe Practices Pamphlet No. 107—National Safety Council.

post-war

5. Further development of vestible and post employment training.
6. Increase in women's vocabulary.

On the other hand a serious by-product will be the release of women when the men of our armed forces are discharged. Most likely, as in the past war, most women will be glad to return to home duties after the flair of work on the production line has faded out. Some will tire of the incessant grind. But many more than in the past war, due to the high wages now given them, will want to remain in the factories. One solution of this is in the employment of wives of men in the service; another will be in the readjustment of wages so that those doing the heavier and more disagreeable or dangerous work and those who are available for a greater range of work will receive higher wages than those who can do only the lighter and more pleasant work; a third solution will be in the inevitable reduction in wages and the weeding out of workers of mediocre ability from the industrial field.

In cases where women have replaced men it has been necessary sometimes to break down the jobs into their component parts, delegating the lighter part of the job to women and the heavier to men. The N. M. T. A. Job Rating Program, properly applied indicates the difference in skill, effort and responsibility in performing these various parts of the job. When the former employes return from the armed services it then may become a practical matter again to combine these jobs into their previous status.

Women Employment in Plants Surveyed

Total employment of the plants surveyed amounts to 221,439. Of this 65,527 or about 31% were women. The range of total employment in individual plants was from 84 to 42,000 and that of women, from 11 to 12,624.

In our survey we visited member plants in various sections of the country and received data from plants located in Illinois, Michigan, Indiana, Ohio, Pennsylvania, New York, Connecticut, Rhode Island and Missouri.

Thirty-three of the plants reported employment of women as their normal procedure, two of them having employed women for over 70 years. Number of plants employing women for varying lengths of time is shown in the summary.

Reasons Given for Non-Employment of Women

Twelve plants that employ no women reported the following reasons for not doing so:

1. Have not yet found need to employ them.
2. Work too heavy.

3. Lack facilities.
4. Build special machines. Not on a production basis.
5. Precedent.
6. Work too varied.
7. Hours too long.
8. Objection by foremen.
9. Women barred from operating foundry cranes which carry molten metal.
10. Loss of contract involving repetitive operations.

Colored Workers

Nineteen plants reported the employment of colored women, most of whom were employed in janitor service. However, one plant reported the employment of 1,200 colored women in every department where women are employed. Other plants reported successful employment of colored women in such occupations as work in a foundry, operation of machine tools including turret lathes, all types of winding operations, inspection, bench work, assembly work, painting, electrical work, riveting, flame cutting and welding and elevator operation. At the Glenn L. Martin aircraft plant in Baltimore, one large department is manned entirely by colored employes. This has not only avoided trouble but has given this group an opportunity to manifest its ability and this has been found to be very satisfactory.

Style of Uniform Important

Usually a single style and color of uniform are adopted by a plant. In one case where there are several plants, a different color is used for each plant. In two cases, the color of the uniform indicates, in a few categories, the kind of work performed. The consensus of opinion seems to be that where distinction of work or departments is desired, it is best to use different colored badges thus permitting an employe to be transferred from one department or job to another without change of uniform. Uniform clothing improves morale, eliminates dress competition and reduces accidents.

Women wearing uniforms take pride in them, feeling somehow that they are like the boys in the Army. Wearing a color similar to that of the male employes makes them feel as though they were, as they should be, co-workers on a par with men and removes distractions due to their introduction into fields so long considered entirely masculine. In only one case in our survey was there any real difficulty in getting agreement by the women employes on the style of uniform. Experience shows the value of consulting employe representatives before a style and color are adopted. The Women's Bureau

of the U. S. Department of Labor gives the following as standards that should apply to shop uniforms for women:

"1. Clothing must be reasonably comfortable in any temperature in which it is worn.

2. It must fit and not interfere with the worker's movements.

3. It must afford adequate protection against the hazard for which it was designed."

While wearing of uniforms is agreeable to most women, few women take readily to the requirement to cover all of the hair. Caps now available do not appear to be satisfactory to women who wish to look attractive even in a shop uniform. Many women insist on wearing at least some of their hair exposed. They should be taught that hair is not caught in machinery simply because it hangs loosely, but that the static electricity set up by rubbing belts attracts and draws the hair into the belt. If the drawing action of the static electricity of rubbing belts were demonstrated to each woman employe, there would be less objection to covering the head and less accidents.

There is an effort to design a suitable hair net. Hair nets, however, do not keep out dust. One company is furnishing a cap with network below the crown. One solution would be to use a net to cover all of the hair and a small cap to keep out dust. Perhaps the best solution would be to use bandanas giving to the ensemble some color and admitting of some individual choice. A bright but serviceable color has a cheering effect on the mental attitude of women. Open-toed and high heeled shoes and the wearing of jewelry, especially rings, are barred in all plants because of the danger they present.

Usually a company does the laundering only when absolute cleanliness is necessary for the protection of the product. Occasionally, however, concerns pay for the laundering in order to be certain that the clothes are kept clean and in good repair. In thirty-two of the plants surveyed, workers pay for the laundering of their uniforms; in 5, the employer stood the expense. In one case, if the worker wears a shop coat, the company pays for its laundering but if the worker owns her own uniform, she pays 15 cents for its laundering. In another case, a rental service is paid for by the worker.

Men Are Preferred as Supervisors

Men alone are used as supervisors of women workers in 49 of the plants. Both men and women are used as supervisors in 12 plants and one employer says he has no preference in the matter. Much of the choice depends upon the length of time women have been employed in the factory and upon the type of work. Even where both men and women are supervisors, the number of women supervisors is usually small or they are engaged in minor super-

visory capacities. In some cases, as in bench inspections, where it would seem women would fit in admirably, they are used successfully as supervisors. In positions requiring technical knowledge and long experience with machinery, men are preferred. Most women prefer men as supervisors. This is due to the more critical attitude of women supervisors over detail matters which, to a man, would seem to be inconsequential. Women, also, are likely to be jealous of supervisors who are of their own sex. Also, they are suspicious of favoritism on the part of such supervisors.

Women's Counselor Has Important Functions

Women acting in the capacity of counselor are employed in 45 of the plants. Fifteen plants have no women counselors and two are contemplating employing them. Wherever women are employed in a factory, it is desirable to have some one or more women to whom the women employes may go with their personal problems. It is desirable that such Women's Counselor be provided with a small private office in which matters may be discussed in confidence. The Women's Counselor should be a mature and preferably a married woman. If she has not had training in first aid and psychology, at least covering human relations, she should be coached in these lines or study them under proper guidance. She should be responsible for the physical and moral well-being of the women, insuring adequate cafeteria, rest room and other such facilities and should cooperate fully with the medical service. She is responsible, also, for the woman worker's mental well-being by keeping in touch with recruits during especially the first month of employment. She should see that adequate housing is provided for those who cannot go home daily. In such plants where a separate woman interviewer has not been provided, the woman counselor may act in that capacity and in cases of release, she functions well as advisor to the exit interviewer.

Various names are given to the woman acting in the above capacity; it is thought the one used signifies her function best. In smaller plants the nurse may assume this function as is done by a number of the plants visited. One of these plants uses women stewards of their union for this purpose. In any case, the function and the responsibility of carrying it out should be clearly defined and the women employes definitely informed as to the person or persons who exercise this function. In larger plants, there may be one or more matrons in rest rooms who act under a Women's Counselor as intermediaries. A few large plants assign a certain number of workers such as 300 or 500 to a counselor.

Through the Women's Counselor and her assistants, improper conduct of any kind on the part of the male employes including foremen, may be nipped in the bud, if it is objectionable to a woman employe, before it assumes the

status of serious moral issue. By this means also, emotional adjustment, which often is more difficult to handle than physical adjustment, may be cleared before it becomes a major problem.

Women Excel in Many Types of Work

Women excel in operation of all types of light machines and in small assembly and inspection work including both hand and precision. Nimble fingers of women enable them to be skillful at all forms of precision work and they take to factory machines as easily as to electric cake mixers and vacuum cleaners and to repetitive work as they do to knitting. Instead of lacking mechanical ability, as is often supposed, they merely lack familiarity with production machinery. Expertness of operation in repetitive work may be developed rapidly by proper instruction. Women are as well equipped mentally as men and learn new processes quite as rapidly as men under the same circumstances where newness of operation is a factor.

Women are now employed successfully in our member plants on such work as light riveting and welding, polishing and grinding, instrument reading and coremaking in foundries, electro-plating and electric-wiring, time study and rate setting, torch and lead tempering, painting and spraying, crane and truck operation, oiling and instrument reading in power plants, soldering, erecting complete machines and in heat treatment work. Women's thoroughness, manipulative ability and delicacy of touch fit them admirably for long spells of accurate work such as where micrometers are needed; women successfully set stops for tolerances of 0.0002″ to 0.0003″ in grinding small parts to limits of 0.0001″. Being observant of small variations in running and finished work, a woman is very efficient in inspection work; little inconsistencies fret her more than they would the average man.

Except for jobs requiring heavy manual lifting and great physical strength, extremely hazardous occupations, those involving considerable stretching and reaching and those in which the worker is exposed to considerable heat, women may be employed successfully in almost any situation, if the job has been tailored to conform with her requirements. Through the employment of electric hoists, trolleys and similar mechanical devices, several of the plants visited are employing women on heavy work such as operation of large radial drills and milling machines and in forge work. In one plant a woman is operating a 25-ton crane. Where jobs need the assistance of men as in set-up or manipulation, the job is usually rerated to make the pay conform to that which is actually done. In some of the plants, women are hired only on jobs in which they can do all of the work without assistance. Three of the plants visited make no reduction in pay because of extra services of men which would not be required if the machine was operated by a man.

Educational and Age Requirements

Because of the difficulty of securing help, most employers of women are today dropping all set educational and experience requirements for work in the shops. Also age limits have been lowered considerably so that, in most cases, the minimum limit is that required by law as modified by waivers and the maximum is dependent solely upon the ability of the applicant. Many women of advanced age are performing their tasks admirably in a number of our plants. Thirty-six of the plants visited have no requirements other than that the woman can read and write; eleven require 8th grade education; eight require two years of high school, and seven high school graduation. Fifty-eight of the plants require no factory or machine experience but most of them regard such experience as desirable. One requires factory experience and two, vocational school graduation.

Unions Favor Employment of Women

With one exception, unions make no objection to the employment of women. One company finds a difficulty in the insistence of its union that, in case of any vacancy, its members (men) may bid on the basis of seniority for the job against the bids of women. This, at the present time, keeps many women from occupation. Hours worked per day and per week vary considerably as indicated in the summary.

Shifts Vary in Number and Time

Number and time of shifts in the plants surveyed vary considerably as shown in the summary. Shift hours in most of the plants are 7 to 3, 3 to 11 and 11 to 7 for three shifts. Thirty of the plants start at approximately 7 A. M., seven at 7:30 A. M., and twelve at 8 A. M. Slight variations in a few cases are made to fit into transportation schedules. Two plants use different shift schedules for different departments.

"Arranging Shifts for Maximum Production," a small pamphlet prepared by the U. S. Department of Labor based upon facts developed by Dr. Nathaniel Kleitman of the Physiological Department of the University of Chicago, presents a new division of shifts as follows: "Red Shift," in which the working hours are from 12 P. M. to 8 P. M., hours for leisure activities between 8 P. M. to 12 Midnight and sleeping hours from 1 or 2 A. M. to 9 or 10 A. M.; "White Shift," in which the working hours are from 8 P. M. to 4 A. M., leisure during afternoon and evening and sleeping hours from about 5 A. M. to 1 P. M.; and the "Blue Shift," with working hours from 4 A. M. to Noon, leisure in the afternoon and sleeping hours from 7 P. M. to 3 A. M. Rotation of shifts, if at all, is advocated to be not more frequent than once in several

months. Efficiency of the individual is found by Dr. Kleitman to depend upon the bodily temperature which varies slightly throughout the 24 hours.

Workers usually prefer to remain on a certain shift because of the difficulty of adjusting themselves to rest changes. Obviously, young women prefer the first of three shifts. Women usually prefer to work on the same shift as their husbands, however, in this case they are not usually employed in the same department as their husbands. Women having small children, and who have someone who can care for them while they are sleeping, frequently prefer the third shift, thus enabling them to see that their children get to school and to prepare their lunches. Doing double duty, as at shop work and having domestic responsibility at the same time, is unduly trying, hence it results in absenteeism or even physical breakdown. Where shifts are rotated, women having children usually are permitted to choose their shift, but they remain on the shift chosen, not being permitted to change except in urgent cases.

Child Care Best Administered by Communities

None of the plants visited have established nurseries where children of war-working mothers may be left during working hours. Some factories *have such nurseries within the plant where children may be left when the mother clocks in and may be called for at the end of the shift. The Cleveland, Ohio, School Board was preparing to operate 25 child-care centers during last summer. Probably the first and best organized industrial nursery is one established in September 26, 1939, and described and illustrated by Carl S. Swisher in the June, 1943, issue of "Executives." The original cost of this nursery is given as about $50,000 and covers a fenced-in roof playground on the top of one of the new plants of Jno. H. Swisher & Son of Jacksonville, Florida. The nursery proper contains 8,500 square feet of space. Some of the youngsters, whose ages vary from 14 months to 6 years, stay at the nursery from Monday morning to Saturday afternoon. Others are taken home by their mothers each evening. The average monthly maintenance expense is $1,800 for about 75 children. About 84% of this expense is borne by the company, the employes using the service paying a nominal amount.

Marketing Problem for Women Day Workers

Women on day shifts find it difficult to do their marketing. To overcome this, which results in absenteeism, it is proposed that cooperation of a nearby grocer be secured by the Personnel Manager of the factory to the end that such grocer will keep his store open for business at an hour convenient to such workers.

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*Steel, December 7, 1942.

Both amounts and types of premium paid for the night shifts vary considerably as indicated in the summary.

Part-Time Workers Need Special Treatment

Part-time women workers are used in only 15 of the plants surveyed, 45 employ none of this type, 2 are contemplating their employment. Of those who employ part-time workers, a number use them only for char work. The number employed in all branches of work range from 1 to 150. One company is just starting to use part-time workers. With the exception of those plants which have made use of the engineering college cooperative plan of training students for industrial employment, few American plants have had much experience with part-time workers. It will be noted that the college cooperative plan included the services of a coordinator and specially trained instructors. A similar provision may well be made where part-time workers are employed in regular factory work.

Research Bulletin No. 67 of the Industrial Relations Section of the Department of Economics and Social Institutions of Princeton University entitled "The Use of Part-Time Workers in the War Effort," which has gone quite exhaustively into the subject, presents much experience of British factories, in which the system of part-time work has been practiced for years. It is stated that two companies reported that they had hired women for short evening shifts in order to make the hours of work meet the restrictions of the state law. The English Ministry of Labor cited as a good example of what can be done in a short time by the proper use of part-time labor, an electrical company which in six months was able to replace 87 of its original full-time male staff with women on part-time of whom 62% were married.

Among the types of jobs most easily adjusted to part-time schedules are: light inspection and assembly work, operation of drill presses, small milling machines, tapping machines and lathes and bench work. The policy of having printed and illustrated descriptions of types of work that are available for distribution to recruits so they may examine them at home, is not only helpful in the pre-employment interview, but effective in reducing turnover. Preliminary discussion of the plan to adopt part-time employment is essential for the successful launching of the program. In no case should part-timers be forced upon a department manager or foreman. A company-wide survey of the opinions of department heads as to the feasibility of using part-timers is a valuable preliminary to its general discussion at a meeting of department heads. Likewise, announcement to full-time workers of the inauguration of a part-time plan, explaining its emergency character, is helpful in securing cooperation from such employes. In Britain, large manufacturing plants often

put part-time workers in a separate wing or department of a factory, however, new recruits can be trained more thoroughly and rapidly when they are placed among experienced full-time workers.

Among the most fruitful supply of recruits for part-time work are housewives and high school students who may work on four-hour shifts. Some companies recruit college and high school students for part-time work principally because they want first chance at employing them in full-time work during vacations and after graduation. Several women's colleges have inaugurated cooperative plans with local war industries. If the work schedule for part-time workers is staggered in the same manner, but for very much shorter periods than prevails in the usual engineering college cooperative plan, idle machine time will be avoided. None of the plants surveyed employ this system.

Equal Pay for Equal Work

In order to make comparisons in the type of pay, we have assumed two categories, namely, hourly or day pay, as the pay received per hour regardless of the amount or efficiency of work accomplished; and incentive pay, including piece rate, which is pay for accomplishment regardless of time and bonus rate which guarantees an hourly base rate but pays a bonus for extra effort according to accomplishment. In some plants both of the above systems are used in different departments. Group bonus systems, which are of the nature of incentive systems but distribute the reward according to group accomplishment in cases where the effort of the individual of a group cannot be measured, are not used extensively.

In cases where wage differentials exist, the initial pay differential between men and women in the plants reporting, ranged from 3 cents to 32½ cents, the average being 10 cents. After the probationary period, women received from 2 to 27½ cents an hour less than men, the average being 11 cents. The periods of probation varied from 30 to 360 days, the average being 51 days. Increase in pay for women at the end of the probationary period ranged from 3 to 15 cents, the average being 6 cents.

Thirty plants reported no difference in initial wage rates of inexperienced men and women and thirty-four reported no difference in pay after a probationary period was served. Actually, differentials in wages for the same job, in most cases, are due to the fact that the jobs involved may require assistance of men for the heavier lifting or handling. These differences are usually indicated in the N. M. T. A. Job Rating Plan where it is used. In almost every case no man would be paid a higher rate for identical work than a woman for jobs open to women employment. In every case women have equal opportunity for up-grading.

Tardiness, Absenteeism and Labor Turnover Impair Production Records

Only four of the plants surveyed offer any award for regularity of attendance. Where incentive pay systems are used, this extra bonus is unnecessary. One employer increases the merit rate of those who have perfect attendance records. Another employer awards a $50.00 bond every two weeks to those having perfect records for that period. At another plant, employes who have a perfect attendance record participate in a drawing on a War Bond and the fourth employer offers as many as 15 bonds a week for similar drawings and assumes as perfect records, those former employes who are now in active war service. It may not be necessary to keep continuous records of tardiness; if such records were made occasionally, especially when increase in tardiness is indicated, they may be found to be adequate for small plants. One company reports successful use of "razzing" of late-comers by their co-workers. This was inaugurated by the workers.

Few plants have adequate records of tardiness, absenteeism and turnover, especially of comparative rates of men and women. Most of the answers to these questions were given from opinions rather than from records. Actual records of these features, together with the services of a trained exit interviewer, permit of adjustments in department procedure that may reduce defections in these matters.

Three fundamental reasons for absences are: illness including pregnancy, accidents which may be either industrial or personal and voluntary or personal absences which are influenced by the weight of domestic burdens, by financial status, and by the degree of conviction of the country's need of one's services. Minor reasons for absences are long working hours, monotony, and poor working conditions.

Suggestions for reducing absenteeism among women employes as given in Research Bulletin No. 66, Princeton University, entitled "Women in War Industries," follows:

"1. More careful selection.

2. A visiting nurse.

3. Special rest rooms to permit women to lie down during the day in case of slight illness.

4. Better arrangements for the care of young children.

5. Not more than 5 to 5½ day work week."

Drawing for a bond at stated periods has certain disadvantages in its attempt to decrease absenteeism, according to the Merchants and Manufacturers' Association of Los Angeles, since the individual who has one day's absence early in the period covered, loses all interest and may therefore absent himself

even more than otherwise during the rest of that period. Absences may be decreased by making working conditions attractive; by use of propaganda posted on bulletin boards and published in company magazines, including records of attendance of the various production departments with the use of slogans; and provision of shopping hours for married women who work during regular store hours. By careful selection and rigid physical examination followed by proper placement, the Allis Chalmers Manufacturing Company has reduced the absentee rate of women under that of their men.

As shown here, absenteeism among women, especially married women, may be expected to be higher than that of men since domestic duties, including care of children and marketing, usually continue to absorb considerable of a woman's attention. Family responsibilities cause more absences than illness. The higher emotional nature of women and their greater susceptibility to sickness lead to more frequent absences from work, but these absences may be reduced as suggested before. Absenteeism is not the whole problem. A sick person on the production line, even if she suffers only from a common cold, is a fractional worker. She is a slower worker and may be a dangerous worker. Her inefficiency is reflected on the work of her co-workers.

Community projects for inducing steady employment such as has been organized so successfully in Cincinnati are very effective. Turnover is reduced when actual records are kept and examined and where there is an adequately trained exit interviewer through whom proper adjustments may be made to reduce defections which may be disclosed by such interviews. Forty-nine of the plants surveyed had exit interviewers. One of these plants has just started this service, one plant is expecting to have an exit interviewer, and in another, the personnel director just insisted that an exit interviewer be employed.

Sources for Recruitment

Most effective mobilization of woman-power has been organized recently by the Industrial Bureau of the New Britain, Connecticut, Chamber of Commerce.

Recruitment and allied data with reference to our survey will be found in the summary. Much objection has been raised to the U. S. E. S. because of lack of discrimination in the persons sent in response to a requisition and the objection often raised by that service to lack of employment of all who are submitted. Employes offer an excellent source of recruitment. This source is particularly effective because in its exercise, the company is advertised favorably and the recruit on employment has a mentor to guide her in her early stages of employment. However, where this method is employed, the recruit is not usually placed in the same department as her sponsor in order to avoid the formation of cliques.

Women Interviewers

Women interviewers are employed for interviewing women in 35 of the plants while in 27 plants, all interviewing is done by men. In one plant the women serve as interviewers only part of the time. Another plant uses a nurse for this function. One of the plants is just breaking in a woman interviewer, while one that had a woman interviewer no longer employs one.

Some "Do's" and "Don'ts" for the interviewer are stated as follows in Special Bulletin No. 12, March, 1943, of the Women's Bureau of the U. S. Department of Labor:

"DO

—determine what is necessary to find out in the interview and pattern the interview accordingly.

—have information from application blank and test scores well in hand before interviewing applicant.

—gain confidence of applicant as early in interview as possible.

—be sure that the physical surroundings are private and conducive to putting applicant at ease.

—give applicant an opportunity to talk freely.

"DON'T

—be unduly influenced by the physical characteristics of the applicant, unless they are particularly important for the job.

—take for granted that habits in one activity are transferable to another; a neat-looking person may not be a neat worker.

—ask questions that are answered on the application blank or attempt to check their accuracy through the interview.

—give the appearance of rushing through the interview.

—ask leading questions.

—overemphasize the age factor; it is ability on the job that counts."

Use of Tests for Recruits, Increasing

Tests for applicants are now used by only 18 of the plants surveyed, while 46 plants do not use them, although two of these are contemplating their use. Of the tests used, one is the Bernreuter, one that of Dr. Schultz, one is the California capacity and mechanical aptitude tests, and two companies are using those of Professor Kapaz. Several plants use the service offered by the

U. S. E. S. but such outside service consumes time and causes delays, which prevents expediting a decision regarding an applicant.

Normally tests for this service should not only be prepared by an expert, but should be administered by an expert. It is claimed in one type of test developed by Professor J. S. Kapaz, Director of Testing and Guidance Department of Fenn College of Cleveland, that it is possible to test applicants by use of a set of mechanical forms operated by the applicant which indicate, in the rear, the record for each rating. These ratings may then be recorded by the one administering the tests, who may be a person of no special training in such matters. Evaluation of the ratings is then made, according to instructions, by Personnel Manager. The battery of tests consists of: (1) mental alertness, (2) mathematical background, (3) ability to get along with others, (4) interest in routine factory work, (5) emotional stability, (6) ambition and drive, and (7) mechanical coordination.

Tests are used as guides, they do not take the place of intelligent interviews by experts, but they reduce greatly the time required to arrive at reliable evaluation. Tests have much to offer in a recruiting, training and upgrading program for individual workers, but they must be properly tailored to the job. In all cases, they should be employed with caution. Special Bulletin No. 12 of the Women's Bureau of the U. S. Department of Labor, March, 1943, gives the following conditions under which tests should be used: (1) all tests should be set up or selected in terms of a specific job based upon thorough job analysis and classification, (2) a testing program should be set up and placed under the direction of someone trained and experienced in industrial testing techniques, and (3) the results should be interpreted and used by experts only. Intelligence tests alone seldom prove useful in industry but, when used with aptitude and trade tests, they can add valuable information. The U. S. E. S. uses parts of intelligence tests in its aptitude and trade tests with satisfactory results.

Married Women Rarely Objected to as Recruits

Fifty-two of the plants surveyed have no discrimination against employment of married women if domestic conditions, such as where young children are involved, do not interfere; seven are favorable to their employment, and three offered no comment. According to Esther Gould in "Management," September, 1928, while "in practically every branch of industry married men are preferred to single men," the opposite is true with women. "The married woman employe," she says, "is a very uncertain factor and in some cases a disturbing one." Today, however, we find such large employers of women as the Western Electric Company, at which about one-third of their women employes are married. At the Vultee Aircraft plant (American Machinist, October 29, 1941)

two-thirds of their women employes are married women, half of whom have one or more children. While objection has been raised to the employment of married women in young women groups because they are supposed to be a potential disturbing influence, this tendency may be avoided quite effectively by proper selection and placement and through the good offices of a properly trained Women's Counselor.

Preference Given to Wives of Service Men

Wives of men in the armed services usually are given preference for employment if they are qualified and there is a vacancy for their service. One objection to their employment is that on the furlough of their husbands they absent themselves from work without regard to the effect of their absence. This, however, is a natural reaction which is infrequent and which would apply also to younger women whose fiances show up on furlough. On the other hand, employment of wives of men serving in the armed forces will relieve the problem of adjustment at the end of this war when reemployment of such men in industry will be a dominant issue.

Fatigue May Be Reduced While Working

Fatigue caused by retaining a given position for long periods may be relieved by what is called "active rest" by its projector, Harold J. Reilly, as illustrated and described by him in the June 22, 1943, issue of PIC. This principle of physical conditioning as used in the plant of the Curtiss-Wright Corporation consists in stretching and flexing strained muscles. For example, if the worker stretches her arms above her head and shakes them, circulation is increased and accuracy of hand and arm movements bettered. Walking with the toes pointed as far out as possible and also when "pigeon toed" for about 10 paces an hour will correct faulty walking positions and tired muscles and arches will be relieved. Another exercise to relieve fatigue due to constant standing is a heel walk and rocking foot movement. For relieving fatigue due to constant sitting, folding the arms behind the back corrects strained back and cramped stomach and neck muscles. It may be added that other stretching and bending exercises carried on occasionally will do much to tone up the physical system.

Although the conditions under which women work in factories are better as a rule, than those under which men work, women are now filling many jobs which are far from clean. Usually, it is found, that women improve the conditions under which they work by their own inherent more cleanly habits. Many states have laws requiring employers to provide such means that a woman may either stand or sit at her work, but while this may be possible,

either sitting or standing may be inconvenient on many jobs so women frequently do not avail themselves of the alternative position. Sitting all of the time and standing all of the time are both considered particularly injurious to women.

Rest Periods

Rest periods observed in the plants surveyed are indicated in the summary. One employer reported that rest periods were abolished because they were abused. This abuse has been experienced in other plants but can be avoided by having the matron in the rest room report occasionally on the time spent in the rest room by different workers. Women employes should be notified that this check is made irregularly and the reason for making it. Most of the rest periods are held in the middle of the morning and afternoon or afternoon and evening work periods as the case may be. In three cases the periods are staggered in different departments so as to avoid conflict.

Rest Room Facilities

In two plants women use the First Aid room if they wish to lie down. Under these conditions, it is held, the need and degree of rest may better be supervised and proper aid afforded if necessary. Fifty-one of the plants provide cots, lounges, day beds or davenports for the convenience of women employes. Matrons or other women acting in this capacity, among whom are three janitresses, are in constant attendance in rest room of 31 of the plants surveyed. In seven they serve in the rest room only part of their time. Twenty-three plants employ no matrons for this purpose. One plant is contemplating employing a woman for this service.

Dressing rooms are provided with individual lockers or their equivalents by 40 of the plants. Six provide them partially, and 16 make no such provision at all. Lack of such provision is due largely to inability, at the present time, to obtain steel lockers. Since women are much concerned with their personal appearance, even when attired in a shop uniform, the provision of a long vertical mirror in the dressing room is much appreciated by them. One of the plants surveyed supplies a dressing table fitted with a vertical mirror. Altogether only 16 plants provide such mirrors for their women employes, 45 do not, and 1 plant is contemplating making such provision.

Smoking

Smoking is permitted while the employe is working by 30% of the plants reporting. In a few of these it is restricted to certain areas. In most cases, women are permitted to smoke in the rest or lunch rooms. At the present time they rarely smoke while working. Smoking times permitted are usually

during rest and lunch periods for from 10 minutes to a half an hour. Only 18% of those reporting specify smoking times during shifts. Only one plant permits the employe to smoke at any time in the toilet rooms. This latter provision is likely to lead to abuse of the privilege.

Recreation Facilities Sometimes Elaborate

Recreation facilities range from nothing to fields with club houses. Most factories have employes' clubs of some kind which usually are organized and administered by employes but sponsored and supported to some extent by the company. Such clubs are found to create a closer comradeship among the employes and a better attitude toward the company. Recreation rooms are used usually directly after lunch, at which time music is furnished in some form. One company has a choral union, another an orchestra of workers, and still another is installing a public broadcasting system which may be used for transmitting messages the president wishes carried over to his employes as well as for dispensing music. Only one plant provided music, for 15 minutes every hour, during the working periods. This is not done to establish tempo except in a general way, since persons differ in the tempo in which they work best, in fact most persons change their tempo from time to time. Women employes work best when they can set their own tempo. Music has been found in some cases, as shown by H. E. Miller in Manufacturing Industries, October, 1926, to increase production. This has been used by the Newark, N. J., works of the Westinghouse Electric and Manufacturing Company, for this purpose.

Transportation a Problem in Outlying Districts

Usually plants located within city limits have little difficulty with transportation. Most of the plants surveyed are so located. Three plants are from 5 to 10 miles from the center of the city, one is a mile from the end of the bus line, and one is ¼ mile from the end of the street car line. In two of these cases a special arrangement was made with a bus line to call for and discharge passengers at the plant at the shift changes. Forty-nine plants have share-the-ride clubs administered by a transportation officer or committee. For a similar reason outlying plants as a rule do not have as good protection for its women workers as those who may call upon the services of the city police as well as their own plant guards during the changes in shifts. In several cases women night workers are escorted to the street car or bus lines. This precaution is not usually necessary when the plant is located in more closely inhabited sections. Adequate protection to the woman worker at the home end of the street car or bus trip, however, is hardly possible during the night periods.

Cafeterias May Improve Health

Cafeterias at which whole meals as well as separate orders are served are furnished by 33 plants. Some of these are company managed and some are concessions. One plant has a dietitian in charge. This may implement the projection of a health program of vast importance. Through the serving of a balanced diet with proper calorie count and vitamin proportion, workers who formerly were fed almost entirely on meat and potatoes will find that other foods, valuable to their well-being, may be prepared in tasty form and so they may acquire the habit of eating them. Through a company magazine, if one exists, recipes giving directions for preparing such foods as well as recipes for preparing inexpensive meals may be carried into the home of the worker, thus benefiting the entire family. Healthful eating is essential to efficient production. Types of feeding services established in the plants surveyed are listed in the summary. Frequently lunch wagons are sent around to different departments or stationed at stated times, usually in the middle of shifts, so that the worker may have a "snack" during what becomes a rest period. In no cases were the workers paid for the regular lunch periods. In some cases it is thought by the employers that a cafeteria or lunch wagon is not necessary because of close proximity to restaurants; others regard a cafeteria to have advantages over other forms of lunch provision in that they add to the fellowship of the co-workers as well as supply better food at less expense than is possible at a private restaurant.

Prune Disciplinary Outshoots as Soon as They Sprout

Employers, in general, dislike reporting any serious disciplinary trouble in their plant especially regarding women. Great increase in the number of social diseases among women working in factories as reported by Chief Justice Edward Scheffler of the Chicago Municipal Court indicates a problem which must be faced. This upsurge in immorality may be controlled and considerably reduced by proper instruction to all foremen and through them to all male workers before employment of women has been inaugurated and periodically thereafter and through the services of a competent Women's Counselor. Six of the plants state that "women are harder to discipline and harder to get along with than men." One states they "overstay rest periods," another reports that "women were most active in a labor disturbance." Proper treatment through the Women's Counselor usually clears up recalcitrant actions.

Proper Training Returns Dividends

Vestibule training, which is generally pre-employment in type and orientation in effect, should be extended to include such post-employment training

which deals with the indoctrination of sound principles underlying the job to be undertaken particularly one of a supervisory nature. For example, all foremen should receive training in foremanship from its aspect of supervising others, however much experience they have had in the lines in which they are to be supervisors. To qualify for a position as Women's Counselor the applicant should have studied some psychology but in any case the study of a book such as "Human Nature and Management" by Ordway Tead would be valuable. Vestibule training may well be carried over to include supervisors. Forty-one plants have vestibule training, two of those are just introducing it and five of them use it only for special work such as welding and inspection. Instructors for vestibule training should include specialists where the subject is of a nature requiring expert knowledge. Recruits in general should be required to take such a course. It affords an opportunity to prune out wrong habits of working. Proper instruction reduces waste, avoids accident, eliminates embarrassment to the newcomer and saves money for the management.

On-the-job training is given in all of the plants. In most cases the instruction is given by foremen or leading workers. In all plants trained instructors are used. Shop schools are used by nineteen plants; forty-three do not use them. One of these is used for specialized training. These shop schools include those following the N.M.T.A. training course, the J.I.T. and T.W.I. government courses. Twenty-six plants cooperate with schools outside of the plant such as Public Schools, War Training Schools, Vocational Schools and Colleges.

Shop training is best accomplished in a separate room or separate part of the shop since the recruit is highly self-conscious on her initial contact with a machine. Also, it is highly desirable that the instructors are trained in teaching methods. Most mechanics want to show how a piece is machined and expect the recruit to grasp the operation without difficulty, also they are apt to resort to telling instead of teaching. It is important that the recruit learn to do the job correctly the first time. Unlearning a process is often a harder procedure than learning it. The National Metal Trades Specialist and Machine Operator Training Material is found very helpful in training. Chief weaknesses of training programs for women in war industries, as given in the Princeton University Research Bulletin No. 66 entitled, "Women in War Industries," are, "(1) insufficient advance planning which results in a lag between the need for women prepared to handle specific work and their availability and (2) frequent lack of centralized formulation of policies and administration, which permits an unevenness of training even within one plant."

Safety Function Needs Definite Direction

Sixty of the plants have some sort of safety organization, but many of these lack specific direction by a person especially trained for safety administration. All of these plants have adequately furnished first-aid rooms or dispensaries, some of them have regular hospital equipment. Among those officiating as safety administrators are men holding the following official connections with their respective companies: Safety supervisor, safety engineer, safety inspector, plant engineer, personnel director, personnel manager, employment manager, supervisor of emergency hospitals, works manager, office manager, production manager, industrial engineer, plant protection chief, chairman safety planning committee, chief guard, superintendent of maintenance and assistant manager.

Twenty-two plants have safety staffs or councils and one has such a council in contemplation. One plant has found safety action to have been stepped up by adding a woman to their safety council. Workers' Safety Committees are in 45 plants and one plant expects to organize one. Safety inspections in three of the plants is made by regular insurance companies. Where women are employed, extra safety precautions require simplicity of attire, barring frills or loose portions of garment and high heeled or open-toed shoes. Jewelry, especially wrist watches and rings, are taboo. Even wedding rings must come off during the working period, since a ring presents a potential danger. Loose hair must be avoided. The whole appearance of the uniform must be workmanlike and free from hazards. Reasons for those special precautions should be impressed upon all women workers. Women follow safety rules seriously if such rules have been presented to them properly.

All but two plants, one of which merely has a first-aid cabinet, have first-aid rooms, dispensaries or hospitals, as indicated in the summary. Among those who are in charge of first aid rooms are first aid attendants, personnel manager, stockkeepers, chief guards and matrons. The number of registered nurses in a plant ranges from none to 40. One plant has a visiting nurse.

Housekeeping Inspection

Housekeeping inspection is carried on by 54 plants, among which is one which is vacuum-cleaned every night for industrial purposes, and another is mopped every night. Inspection periods range from once a day to once a month. Inspections are made by persons ranging from janitor, guards and matrons to a personnel director, a sanitary inspector, a foreman of maintenance, a plant manager, a superintendent and finally a vice-president. In 12 plants the inspection is carried on by committees and in two, by inspectors of insurance companies.

Grievances

Grievances, such as stem from wages, hours, bonus, etc., follow the usual grievance procedure in method of reporting and adjustment. In practically all plants the worker reports first to her foreman, then, if the shop has a union contract, she reports in turn to her steward and the grievance committee. If there is no such union connection, after reporting to her foreman unsuccessfully, she may bring the matter, in turn, before the superintendent, employment manager, personnel director up to the president of the company. Various modifications of this line of procedure are practiced, but the same general method is followed. In all successful labor relations it is possible for a worker to present her grievance to the chief administrator if necessary. Grievances are generally adjusted by conference, if necessary, with a committee composed of representatives of both the management and the employes.

Complaints—Misconduct

Complaints regarding personal matters such as misconduct are best handled through the Women's Counselor or, if there is no such supervisor, through a matron, nurse, woman interviewer or other woman. Women prefer to take such matters to a woman, although they will not hesitate today to present them to any man or committee of men. A properly qualified women's counselor may be able to clear up a complaint of this kind without taking it up further, but usually she consults the Employment Manager or Personnel Director. Great variety of persons to whom such complaints are made are reported by the plants surveyed, including, besides those mentioned, forelady, foreman, union steward, welfare director, and even storeroom clerk. In one case the matter is handled through their suggestion system.

Loose ends should be avoided. Organization for the employment of women in industry, like all other undertakings, will be efficient if each phase is properly planned, scheduled and executed according to schedule and if all of its integral functions are headed by adequately qualified persons endowed with sufficient authority properly to administer their particular fields.

PART IV

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Inaugurating a Test Program; By Edward N. Hay, American Management Association Personnel Series No. 43, 1940, pp. 25-33.

Values of psychology in industrial management.

Machine Shop Instructor's Manual; National Metal Trades Association.

Machine Shop Technology; National Metal Trades Association.

Operation, job instruction and machine tool series.

Management Program to Help Your Plant Increase Employes Production Efficiency; Vocafilm Corp., Chicago.

Sets of motion picture sound films covering; training new employes, preventing grievances, cutting the accident record, improving human relations, increasing quality standards, improving morale, upgrading older employes, increasing individual efficiency.

Methods and Materials for Vocational Training; By Hill and Ewing, McGraw-Hill, 172 pp., $2.00.

Presentation of teacher training material, trade analysis, graphic presentation, written instruction sheets, operation sheets, information sheets, related instruction.

Training of Victory Workers; By Council on Training of War Production Workers, Published by Committee on Education, Chicago Association of Commerce Bulletin No. 7, April, 1942.

Bulletin of plans for the training and handling of workers on products for victory.

Training Women for War Work; By J. B. Neeley, Iron Age, August 6, 1942, 2 pp.

Illustrated article advocating preliminary "conditioning" of women to avoid fear of operating high-powered machine tools.

from

JOHN PHILIP SOUSA, III

815—15th STREET, N. W.
WASHINGTON, D. C.
TEL. REP. 5790

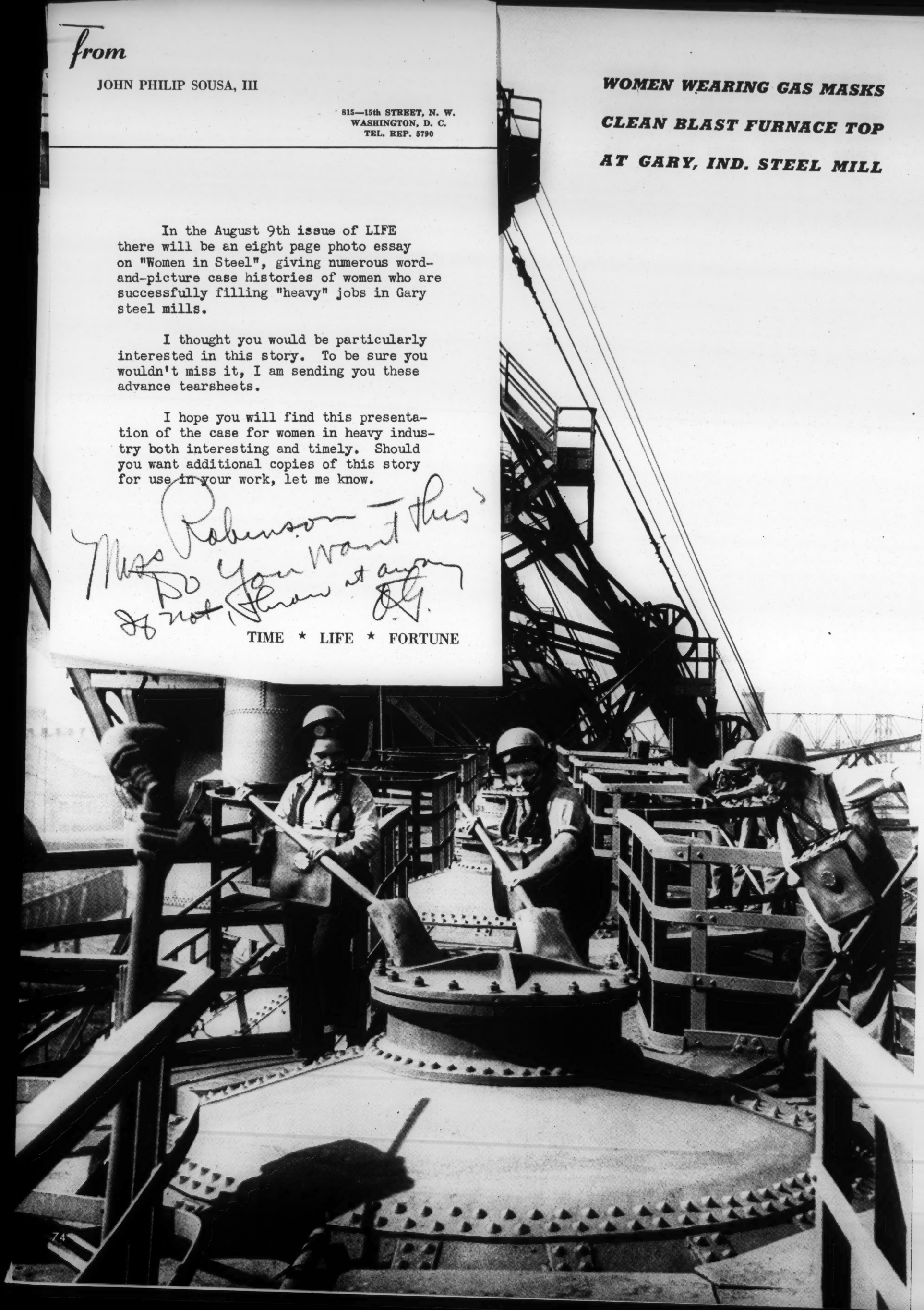
In the August 9th issue of LIFE there will be an eight page photo essay on "Women in Steel", giving numerous word-and-picture case histories of women who are successfully filling "heavy" jobs in Gary steel mills.

I thought you would be particularly interested in this story. To be sure you wouldn't miss it, I am sending you these advance tearsheets.

I hope you will find this presentation of the case for women in heavy industry both interesting and timely. Should you want additional copies of this story for use in your work, let me know.

Mrs Robinson — Do you want this? If not, throw it away. J.P.S.

TIME ★ LIFE ★ FORTUNE



WOMEN WEARING GAS MASKS CLEAN BLAST FURNACE TOP AT GARY, IND. STEEL MILL

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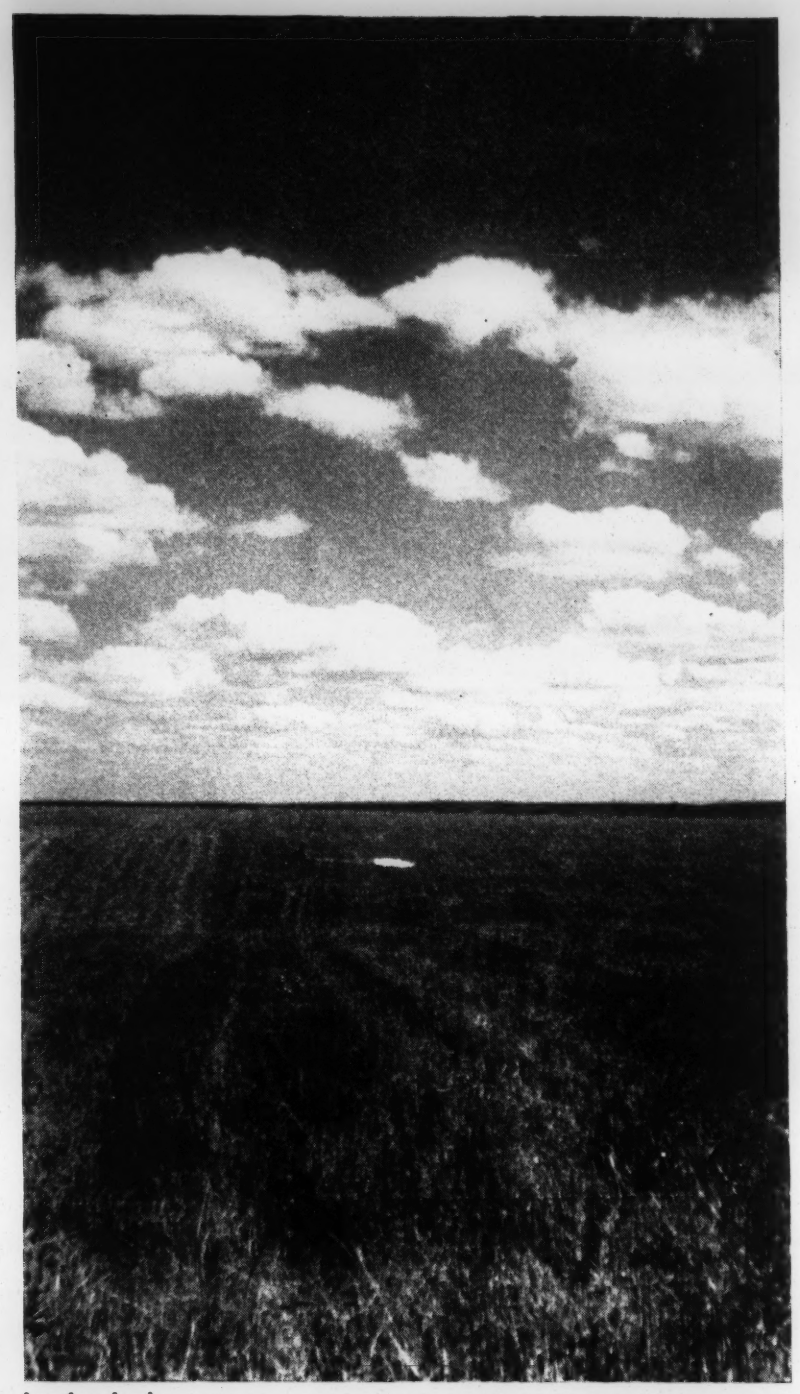


Lovelace lands in this wheat field near Ephrata, Wash., where his jump was made because of the large flat terrain which offers a minimum of hazardous obstacles to a parachute landing. Smaller plane landed close to Lovelace a few minutes later.

Shielding his eyes from blazing sunlight, Lieut. Colonel Lovelace lies on his parachute silk. His jump was not a delayed-opening fall. The parachute was opened as soon as he left the Fortress by a static cord fastened to a clamp in the bomb bay.

GINGIVITIS

may be attacking your gums this very moment!

4 OUT OF 5 May get it—Neglect often leads to dreaded PYORRHEA

If you want your teeth to continue to look healthy and handsome—don't neglect your gums! *Healthy teeth need firm gums.* And one of the most common enemies of healthy teeth and firm gums is GINGIVITIS, which may attack 4 out of 5 people.

While Gingivitis is a mild gum inflammation—*never* neglect it, because it often leads to Pyorrhea with its soft, receding gums and loosening teeth which only your Dentist can help. So see him every 3 months. Then at home here's—

One Best Way To Help Guard Against Gingivitis

Massage your gums and brush your teeth twice daily with Forhan's Toothpaste. Forhan's is the *first* and original toothpaste made *especially* for both massaging gums to be firmer—more able to ward off infection and for cleaning teeth to their natural brilliant lustre. Forhan's also helps remove that acid film which so often starts tooth decay. No wonder so many dentists have used and recommended Forhan's for so many years! At all drug, department and 10¢ stores.

How 95% GINGIVITIS CASES Improved in 30 Days!

Clinical investigation shows that a 30-day test was made with hundreds upon hundreds of people who had Gingivitis. Approximately half were first given dental prophylaxis. ALL were instructed to massage their gums twice daily with Forhan's Toothpaste. In 30 days—95% of the Gingivitis patients *improved!* Get *your* tube of Forhan's *today*—start massaging *your* gums with Forhan's *tonight!*

use **Forhan's** *with massage*

FOR FIRMER GUMS—CLEANER TEETH

WOMEN LABORERS CLEAR TRACKS OF SPILLED MATERIALS. THIS "HIGH LINE" CARRIES ORE, COKE AND LIMESTONE TO BLAST FURNACES

WOMEN IN STEEL

THEY ARE HANDLING TOUGH JOBS IN HEAVY INDUSTRY

Photographs for LIFE by Margaret Bourke-White

Since the start of the war, U. S. women have quickly and ably assumed many jobs traditionally held by men. The bulk of this new womanpower has been funneled into relatively light industry, such as aircraft. In 1941 only 1% of aviation employes were women, while this year they will comprise an estimated 65% of the total. Of the 16,000,000 women now employed in the U. S., over a quarter are in war industries. But until recently only a small percentage has been used to replace men in heavy industry. Although the concept of the weaker sex sweating near blast furnaces, directing giant ladles of molten iron, or pouring red-hot ingots is accepted in England and Russia, it has always been foreign to American tradition. Only the rising need for labor and the diminishing supply of manpower has forced this revolutionary adjustment.

To present the first comprehensive picture of women toiling in heavy industry, LIFE sent Photographer Margaret Bourke-White to Gary, Ind., where 4,800 women are now employed in the plants of United States Steel Corporation subsidiaries. As the pictures on these and the following pages show, women are now handling an amazing variety of jobs, some completely unskilled, some semiskilled and some requiring great technical knowledge, precision and facility.

The women who have taken over men's jobs in steel are receiving the same rate of pay as the men. They work eight hours a day, six days a week. On the basis of a 40-hour week the minimum pay is 78¢ per hour or $31.20 weekly. However, in the 48-hour week the sixth day is at time-and-a-half pay, making the women's weekly wage at least $40.56. Women are now working in the Gary steel mills as welders, crane operators, tool machinists, laborers (*see above*), electrical helpers, grinders, oilers, coil tapers, foundry helpers, checkers, loaders, metallurgical helpers, painters, cleaning and maintenance workers (*see opposite page*), inspectors, draw-bench operators, engine operators, furnace operators, billet operation helpers, packers and shippers. The length of this list is especially significant because before Pearl Harbor virtually the only women employed in the Gary steel-mill area were the sorters in the tin mills.

WOMEN EMPLOYES at Tubular Alloy Steel Corp. in Gary predominate at pep meeting which is listening to Pvt. John Adams of Detroit, wounded Buna veteran.

As case histories on pages 78-79 indicate, the women are recruited from Gary and nearby East Chicago. A minority has drifted in from agricultural areas. They are black and white, Polish and Croat, Mexican and Scottish. Many have husbands, fathers, sons or sweethearts who are working or who once worked in the mills. Nearly all have relatives in the armed forces. Very few had any industrial experience prior to their employment in the steel plants.

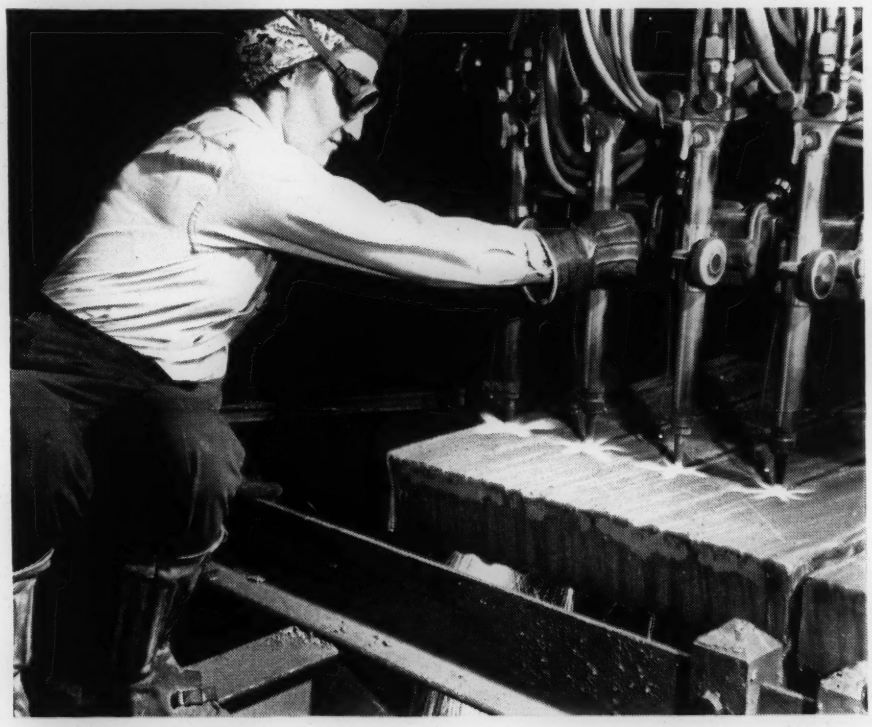
The women steel workers at Gary are not freaks or novelties. They have been accepted by management, by the union, by the rough, iron-muscled men they work with day after day. In time of peace they may return once more to home and family, but they have proved that in time of crisis no job is too tough for American women.

CONTINUED ON NEXT PAGE

STAMPING MACHINE in rail mill at Gary is operated by Mrs. Florence Romanowski (*right*). She mechanically brands identifications into red-hot rails. Her husband is in Army.

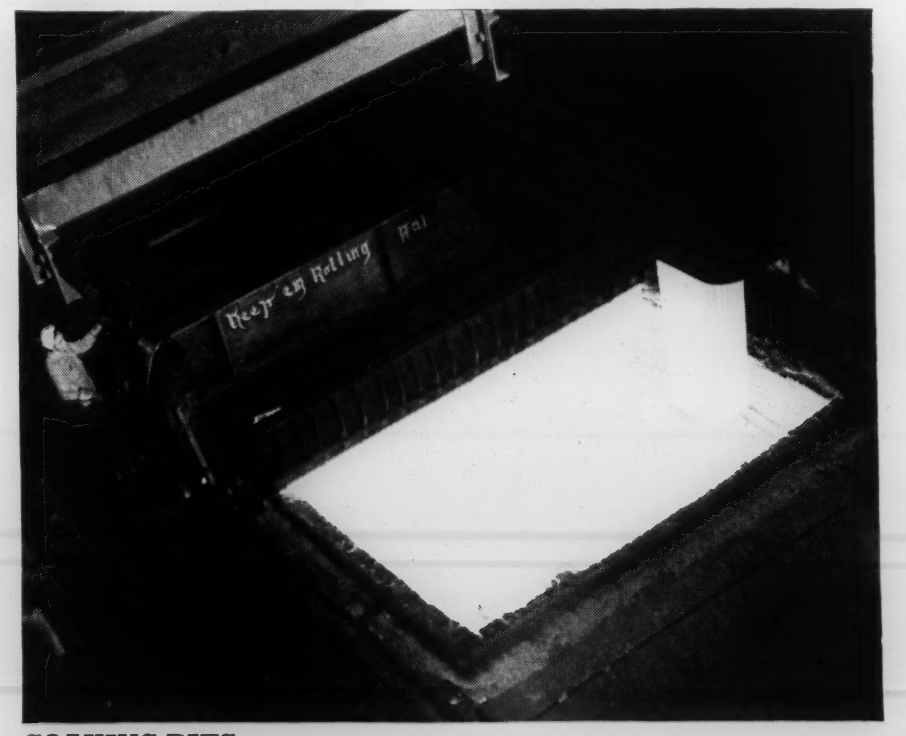
SCARFING is the operation which removes surface defects from slabs to condition them for rolling. Girl (*center*) marks out defects with chalk for man who is doing the scarfing (*right*).

BEVELING ARMOR PLATE for tanks at Gary Works, these women operate powerful acetylene torches. They are called "burners." Beveling is done prior to finishing of pieces.



FLAME CUTTING of a slab is done by four-torch machine controlled and operated by one woman. Alice Jo Barker (*above*) has a husband and son who also work in war industries.

"PAN MAN" at Gary Works is Mrs. Rosalie Ivy, a husky Negro laborer. She is mixing a special mud used to seal the casting hole through which molten iron flows from a blast furnace.



SOAKING PITS in rail mill are mechanically covered and uncovered by the "cover craneman," Polish-American Elizabeth Laba, 23. Here ingots are reheated to an average 2,300° F.

TRANSFER CAR OPERATOR Mae Harris, 23, signals craneman above to return the empty, hot metal ladle to the transfer car (*left*). The ladle has contained molten iron which has been poured into an open-hearth furnace. In the furnace the molten iron is added to molten scrap which, together with iron ore and fluxes, results in finished steel after refinement.

CONTINUED ON NEXT PAGE

BERNICE DAUNORA, 31, is a member of the "top gang" and must wear a "one-hour, lightweight breathing apparatus" as protection against gas escaping from blast furnaces (*see p. 74*). Mrs. Daunora, who is of Scottish descent, is married, has one son. Her brother is in the armed forces. She has been working at Carnegie-Illinois since last February.

KATHERINE MRZLJAK, 34, is one of top gang. She is Croatian, has two children. Husband also works in mill.

THERESA ARANA, 21, takes down temperature recordings at the draw furnaces in the Armor Plate Division.

AUDREY MAE HULSE, 20, is flame cutter at the American Bridge Co. in Gary. She has five relatives in plant.

LORRAINE GALLINGER, 20, is metallurgical observer. She is from North Dakota, plans to return after war.

LUGRASH LARRY, 32, a laborer in Blast Furnace Department, has four children. Husband works in Billet Mill.

BLANCHE JENKINS, 39, is welder at Carnegie-Illinois, buys a $50 war bond each month. She has two children.

VICTORIA BROTKO, 22, is a blacksmith's helper. She took her twin brother's job when he joined the Marines.

DOLORES MACIAS, 26, of Mexican descent, has a son. She has been a member of the top gang for five months.

ANN ZARIK, 22, is a flame burner in Armor Plate Division. She is shown working at her job on this week's cover.

CONTINUED ON NEXT PAGE

IN THE FOUNDRY of the Carnegie-Illinois Steel Co., these women are at work as core-makers. A total of 18 women are employed here on two shifts. The core-maker's functions are like those of a sculptor, and the implements used are trowels, spatulas and mallets. Castings being made in this picture are for use not only at Carnegie-Illinois but at other plants.

ON AIRCRAFT CARRIER DECK women work as welders and scrapers. Girls alongside this steel prefabricated deck section who are without headgear and masks operate tools which scrape loose surface imperfections in preparation for welding. The welder in foreground has her name "Jakie," written on helmet, a popular style note among lady welders.

GIRL METALLURGICAL OBSERVER USES OPTICAL PYROMETER IN DETERMINING TEMPERATURE OF STEEL IN OPEN HEARTH

American tanks, a jeep and a captured gun are parked in Cathedral square in the center of Gela. Outside the city, at this very minute, a big tank battle is raging. Below, Italian civilians crowd around American Rangers, asking for food and cigarets. The conversation is half in bad Italian and half in bad English.

ADVENTURE

LIFE correspondent encounters blazing guns

by JACK BELDEN

Jack Belden, war correspondent for LIFE and Time, *has been with the U. S. Seventh Army since it began the conquest of Sicily. In the issue of July 26, LIFE published his story of the landing at Gela. In these dispatches Belden describes some high points of the American sweep across the western half of the island to Palermo.*

Butera, July 12

Last night I went out with Lieutenant Colonel Bill Darby's Rangers, attacked a mountain and captured a town.

None of us had slept for three days when, just before dusk, we gathered in Darby's command post in a hillside cave overlooking the town of Gela. Lying on straw like a mountain Robin Hood, with a bottle of captured Italian wine in one hand and a map in the other hand, and surrounded by his informal crew of captains, lieutenants, sergeants and privates, Darby told us the mission for the night.

It was to attack the town of Butera, sitting like a sentinel on a rocky prominence overlooking the pass on the Gela-Enna highway. "This is going to be a tough one, gang," he said, and with his finger and a flashlight dimmed with a red glass, he showed us the steep climb we had to make between two hills held by the enemy on either side of Butera.

"I don't know what is in Butera and we may be sticking our necks in a trap," he added, "but that is the job we have to do."

Turning to me he confided, "Our operations aren't according to Hoyle, but we get along."

But before we could get along there was an urgent task to perform and that was to clear the thick mine field along our route of march to Butera, eight miles away.

Skilled sappers were supposed to do the job, but they hadn't arrived and the zero hour was approaching and we couldn't wait. So Darby called his handy man, Captain Sammy Sams, a soldier jack-of-all-trades in the Ranger outfit and said, "Sammy, can you get someone to clear those mines?" Sammy raised himself to his full height of 5 ft. 6 in., twisted his straggly handle-bar mustache, which he had grown under British influence when stationed in Scotland, and declared, "I clear 'em myself."

"You stay out of those mine fields, Sammy, I can't afford to lose you," said Colonel Darby, but Sammy was already scurrying down hill in a jeep.

A short while later he was back twirling his mustache again. "Funny thing," he said, "I reached down for those mines and the first thing I did was to shake hands with the arm of a Heinie. Then I found some more corpses in that mine field. Got some Lucky Strikes out of the pocket of one of the corpses. Here, have one," he said, producing the pack.

Now that Sammy had cleared most of the mine field, we were ready to start off. Just before we departed we heard a burst of machine gun and flashes of fire in the sky and looking up, saw a Spitfire plummeting to the ground in flames. Then above it we saw a brown figure supported by a parachute which had come out of its pack but hadn't opened. Helplessly we watched the pilot hurtling toward the ground. "Poor devil," said everyone.

Captain Charles ("Chuck") Shunstrom of Radburn, Fair Lawn, N. J., though only 22 years old was to lead the assault. Shunstrom was in great haste as he rushed through the explanation of the operation with his lieutenants and sergeants: "Only I will shoot red and green flares. Only I. Got that? Men will march with fixed bayonets."

The men gathered on the road. Then stealthily, crouching like a cat, the first man went forward with his bayonet held in front and others followed. Behind them Chuck Shunstrom's voice cried petulantly, "Get apart, get apart. If we are ambushed you'll want plenty of room." The men bent over double and shuffled forward in a slow creep. I fell into the column behind Shunstrom.

In a little while on our right we passed the remains of freshly wrecked vehicles. Sprawling on his stomach and face, with hands outstretched, was a figure in civilian clothing. Dimly near the center of the back I made out a dark stain. To see a civilian dead in a

These Women Are Helping

PM 12/10/42

Powerful Peggy Szklarski, who works in a steel plant at Gary, Ind., displays a stout right arm. She is employed as a coremaker's helper and wields a heavy mallet at her work. Women like her, replacing men in service, are doing a wonderful job of keeping wartime America a going concern.

Labor Shortage Eased by Women Taking Many Heavy Jobs in Mills. (extract)

From Steel, May 10, 1943, p 51

The Republic Steel Corp. has listed the following jobs formerly held by men in which women are now working:

Burners: These women are being used in the mills and various other locations in the plant for the gas cutting of steel scrap.

Chainmen or hookers: In practically every operating department in the plant women are being used for such purposes. They place slings and chains around materials to be either loaded or unloaded from railroad cars.

Crane operators: Women are being used in the bar mills.

Engineering learners: Women used in the less important jobs of tracing. Also used to operate blue print machines.

Helpers: Under this heading come a group of women in the chemical laboratory where with some instructions they will be able to carry on routine analysis work.

Metallurgical helpers: Women help where samples of iron and steel are worked into a standard pattern through the use of lathes, presses, etc., and these women under direction qualify to do most of these tests.

Power house helpers: Women are used in the power department for assisting the men, principally along electrical work. Electrical helpers are used for routine checking of wire work and minor installation work.

Machine shop helpers: Women work in the machine shop on such equipment as lathes, boring mills, drill presses, planers, shapers and other standard machines. Helpers are employed in the pipe shop, principally on pipe assembly and similar types of work.

Welder helpers: Women work in the welding shop for standard welding. Helpers are used in the operation of mill shears, and their duties consist in handling materials to and from these mill shears.

Inspection: Women on visual inspection work which leads to to the use of micrometers. Also under inspection, visual inspection and marking of steel billets for scarfing and chipping.

Scarfers: A number of women are being trained to do the actual scarfing of steel, which is the process of eliminating breaks, seams, cracks, lap ewells and defects from steel billets with a torch.

Skid men: Males are being supplemented in these jobs by women in the handling of billets from the billet yard to the heating furnaces in the finishing mills.

Roll shop apprentices: Women will be placed in these positions to learn the turning of rolls on lathes in the roll shop.

Labor: Women are being used in most operating departments in the plants as laborers. This ranges from blast furnaces laboring where they are used on clean-up work, principally slag and refuse. In bar mills women are used for clean-up work and bundling and such labor work as might be found around a mill. A large group of women are at work in the mason department for tearing out burnt-out furnaces and assisting bricklayers in rebuilding. Women are employed as laborers in the shipping department for the loading of finished material, most of which is handled by cranes. In the open-hearth department and yard department they are being used principally for general labor work.

Captions under two pictures

1. Woman swagging steel bars in Republic's Buffalo plant.

2. These women have replaced men in the tank armor ordnance plant, Carnegie-Illinois Steel Corp., Farrell, Pa. They are making a final check on one of the big plates.

Metal Trades

OFFICE OF WAR INFORMATION
U. S. DEPARTMENT OF LABOR

Release:
September 26, 1943.

OWI-2503

The machine-tool industry, throughout its history the exclusive domain of the highly-skilled master mechanic, has opened its doors to women workers and doesn't regret it, Secretary of Labor Perkins reported today on the basis of a survey of the Women's Bureau of the United States Department of Labor.

Up until Pearl Harbor there were virtually no women wage earners in the machine-tool industry, the survey shows, and it took the drafting of machinists to allow women to show that they could come, see, and conquer a 3,000-part turret lathe. The influx of women into this trade has been one of the most striking labor adjustments of the war economy, and though production of machine tools has now fallen off, the report states, the proportion of women in the plants is still increasing. Thousands of women operators have helped to achieve the rapid retooling of American industry for large-scale war production and are now keeping the factories supplied with machine replacements.

Agents of the Woman's Bureau made a survey of machine-tool plants which employed approximately 45,000 workers - over one-fourth of the estimated total force of the industry. Of these 45,000 employees 2.1 percent were women in the factory. This ratio has increased since the making of the survey, the Bureau notes, and is doubly significant because the field was barren of women prior to the "defense" period.

"The machine tool is an intricate mechanism," says the report. "The tool itself, the instrument that actually cuts into the metal, is one of the smaller parts of the machine. There may be a ton or more of frame, ram, gears, racks, and other devices all coordinated to direct the small tool in its course through or against the metal to be worked. Machine tools may range in size from those small enough to mount on a bench and weighing only a hundred pounds to giants that stand as high as a three-story house and weigh several hundred tons."

Objections to the employment of women in the machine-tool industry stemmed from the character of the work. Since it is not a mass-production industry, frequent set-up of the machines is required, and many of the parts must be machined to very close tolerances, some of them so accurately that a leeway of only a few ten-thousandths of an inch from the exact dimensions specified is permitted. Foremen claimed women could not do the work, since much of it required extraordinary skill or technical knowledge and the size and weight of parts demanded a high degree of physical strength or endurance.

(over)

X-20529

Urgency is the father of compromise, however, and it has been estimated that most of the men making machine tools in January 1942 had never seen the inside of a machine-tool plant 2 years before that date. Apprenticeship training of 3 and 4 years gave way to a few weeks' instruction on one specific machine or job. Training of this kind broke down an all-round machinist's skill into its component parts and in one plant yielded enough skilled men to start a third shift, thereby doubling production within 3 months' time.

"Women as well as men have been successfully introduced into such short-term training programs and have proved to be apt pupils," the report says. "In some plants good tooling has replaced individual skill. As one executive has said, 'The machine tool now does the physical work which formerly was done by the operator. The machine tool has within itself the precision and the power needed to get the job done. All that the operator has to do is to have the intelligence and the dexterity to operate the machine. It seems natural that girls should be able to learn this craftsmanship just as well and as rapidly as boys, and so make good machine operators.'

"Though they have been in the industry a relatively short time, women are doing accurate work on jobs requiring, for example, machining to a tolerance of .002 inches, or a fifteenth part of the diameter of a hair. It was said more than once that women had been found unusually conscientious about following instructions exactly. Further, where small lots are common some women already are learning the setting up of their own machines."

The Bureau stresses the fact that conversion of the machine-tool industry to munitions-making creates an increase rather than a decrease in the demand for women workers. This contention is based on War Production Board figures which show that when wage earners in the machine-tool industry reached their peak level in November of 1942 women were 6.8 percent of the total. In April 1943, with 14,000 fewer wage earners employed, 11.2 percent were women.

Results of the Bureau's survey are in a bulletin, "Employment of Women in the Machine-Tool Industry, 1942," released today.

X-20529

From THE CONSOLIDATED NEWS (Of Consolidated Vultee at San Diego)
July 8, 1943.

Professional

WOMAN ENGINEER BEGAN AS CLERK JUST YEAR AGO

An artistic soul, under control of a very practical mind - and there you have an idea of Mrs. Pauline ~~Engel~~ Angle, Dept. 44, who is one of the only two feminine methods engineers serving Consolidated. She specializes as an investigator of employee suggestions working directly in the shops to check up on ideas to speed up production.

Just a year ago she started as a clerk in the Employe Suggestions group of Industrial Engineering. She applied herself so diligently to this study that, last February , she qualified as a methods engineer.

Her artistic talents were developed from study both at University of Arizona, where she majored in art and music, and at Chicago's famed Art Academy. Though born at Imlay City, near Detroit, she has lived for the past 20 years at Tucson, Arizona.

Her husband, Joe, formerly a Convair worker, has gone back to the good earth. He is doing contract harvesting up north. This, they both thought, was best for the war effort, though it forces them to separate for a time.

U. S. Department of Labor
WOMEN'S BUREAU
Washington

Present jobs of women in steel mills in January 1943 in Calumet area (South Chicago and Gary, Indiana)

laborers - cleaners, sweepers, slag shovelers - in blacksmith shop, foundry, blast furnace, stock house.

Maintenance shops - welders in repair work, machine operators (lathes, gear cutters, drills, etc.), electrical (taping, winding coils, soldering, etc.)

core makers
crane operators
inspectors
chemists (laboratory aides)
factory clerks

Courier Express
Buffalo, N.Y.
May 9, 1943.

WOMEN IN "IRON-MAN" INDUSTRY SUPRISE VETERANS BY ABILITY TO TAKE HARD WORK

More Than 800 Have Jobs in Plants Here

by Leonard G. Feldmann

Making steel is a man-size job.

But there are more than 800 women in the steel plants of Buffalo who have stepped in patriotically to help solve the manpower problem of producing the thousands of tons of steel needed daily for war weapons.

Mill officials admit that steel operations would have struck a snag had it not been for women invading this traditionally-masculine, mightiest of all American industries.

Steelmen Surprised

These women, ranging from the early twenties to the late 40's are real heroines of the homefront. They didn't shop around the so-called "glamour" plants to find an easy spot. They knew they could do the most for the war effort in the steel mills.

And steelmen are only too willing to go on record that they are "greatly surprised at the ability of women" to do such heavy work.

Former store clerks, beauticians, waitresses and housewives, the majority with no previous experience in heavy industrial lines, have undertaken the "dirty work" to hurry the return of a relative or dear one from the battlefronts.

In more than three months, only 38 of those hired at Bethlehem have found the work not to their liking. This is less than 10 percent of the total. Republic reports that 500 women hired for industrial work with the same percentage of resignations. This is considered very low.

The women are no softies, most of them prefer and are working 48-hours a week. They range in weight from 100 to close to the 200 mark with the majority being between 135 and 170 pounds.

Both Bethlehem and Republic are planning to hire additional women. It is estimated women could be used in steel production to the extent of about 18 to 20 per cent of total employment without hampering production.

Many More To Be Used

Bethlehem's total employment at present is about 12,000, meaning it still can hire 2,000 women. Republic with a payroll of about 3,000 can hire about 100 more.

Working conditions in the steel mills undoubtedly are much better and far safer than formerly, but the work is heavy and the danger of overhead cranes still exists.

But the women love it all. That's the truth. There wasn't one of the many leaving their posts long enough to be interviewed(with special permission of the superintendent), who didn't emphasize that "I love my job."

These stalwarts refused to select a job "where a lot of talk about loafing is heard." They want to work.

They're not doing only the common labor sort of jobs, either. They're working as scarfers, burners, chainmen or hockers, crane operators. And mill spokesmen said they would be used in other departments too.

Both mills said they have lost no production in the changeover from male to female help.

Starting our tour, we went down in the cellar of the open hearth and found a group of ten women tearing down the brick walls of the furnace's checker chamber. The furnace burnt out had to be rebuilt.

With tongs in hand, the women dug in to drag out the old bricks weighing about 7½ pounds each with 5,000 to 6,000 to each furnace. The din of a plant locomotive overhead carrying supplies to furnaces were ignored totally.

They Handle Hot Jobs

Walking through the yard, we found a platform fifteen feet high, on which women were working with long bars knocking "hot tops" from ingot molds. A "hot top" retards the rate of cooling of the steel to insure its freedom from objectionable blowholes.

Moving over to the grounds surrounding the No. 1 open hearth building, we found two hard-working women loading heavy forms of steel scrap into charging boxes to be placed in furnaces for conversion into armament.

"I like my work very much," was the volunteered remark of Mrs. Lupe Abda, Spanish born American, of 91 Ridge Road.

"Before I took this job, I was employed at Hongerer's, altering dresses and doing other sewing," she added, tugging at a crane magnet heavily loaded with scrap.

Mrs. Abda, who is 37, said her husband was working at the No. 2 and a son at No. 3 open hearth, giving the Abdas a representative in all three of Bethlehem's open hearth departments.

Republic has gone farther in the employment of women than Bethlehem. It has them in some heavy jobs requiring skills and training.

Women are handling acetelyne torches, cutting scrap into the various shapes required for use in the furnaces.

Din Doesn't Bother Them.

As chainmen and hookers, they wrap the heavy crane chains around hundreds of tons of steel billets, bars, etc. When the hookon is complete, the crane operator, who also might be a woman, sounds a siren warning the load will be lifted and moved rapidly to its destination.

Five of these overhead traveling cranes operate in the same department at one time. Sirens indicating the movement of hundreds of tons of steel sound at brief intervals. All of which doesn't seem to bother the women a bit.

They step aside and let the cranes with their heavy loads move merrily along, while the next chain is slung around another huge bundle of raw steel.

"I've been doing this work since December 21st," Mrs. Frances O'Neill, of 62 Amber Street, declared as she took time to straighten her padded gloves. Mrs. O'Neill, who is 39, siad her only previous experience in industrial work was two weeks in a box factory.

Her partner on the other side of the hook was Mrs. Helen McNerney of 18 Strathmore Street, who is 26.

"I came to help my husband, who works in the bar mill, turn out the steel needed for war production," she said.

They Wield Torches

While steel is being processed into its final form, seams and other defects often appear on the surface. Scarfers using a torch rid the billet of such defects.

Until the war, this, too, was a man's job. If men are available they're still doing it. When they're not, women have the job, and do it well.

"I was a beautician for thirteen years before I came to work here," Gladys Chase, 528 William Street explained. She added the oft-heard remark, "I like my work."

Outside this particular mill railroad cars were being loaded and unloaded. Again women were "manning" the hooks of overhead cranes. Weather conditions seem to go entirely unnoticed.

N.Y.C. American Metal Mkt. May 12, '43

Press Intelligence clipping

Women Workers In The Steel Mills

A steelworks in one of the big producing areas of the middle west has placed an order with its local United States Employment Service for a good many hundreds of women workers who will do what the employer describes as "pick and shovel" work. This means manual labor of the toughest kind. The steelworks didn't want to hire the women. It had no alternative. No male labor was obtainable in anything like the quantity required to keep this establishment going at the rate necessary to meet the war demands.

The situation confronting this firm is by no means exceptional. Take Republic Steel, for example. Last October it had 585 women on its payroll, and the great majority of these were workers of the clerical type. At the beginning of the present quarter, Republic had 5,842 women workers, and the number was going up steadily.

Most of the big mid-western steelworks now have women as nearly 10% of their total working force. This proportion is close to that which British steelworks have reached in spite of their much more acute manpower problem.

J. H. Thompson, in reviewing the British steel industry for 1942 in "The Mining Industry" of London, had this to say, regarding the limitations of substituting women for men workers in the steel mills:

"The manpower problem has been a continuing source of anxiety, since the steel industry, vital as it may be for the nation's war effort, has not been exempt from the comb-out for Servicemen. To a considerable extent men have been replaced - successfully replaced - by women. But the more arduous jobs at the furnaces and rolling mills are beyond a woman's strength and probably the practical limits of the withdrawal of men from the works have now been reached."

A study of personnel records of the steel companies shows women workers as loaders, crane operators, sample testers, welders, etc. But even the superintendent of one big mid-western works had to laugh recently when a woman was certified to him as a competent "hot chain man". She proved to be just that and is working full shifts in a big plant which is turning out important alloys.

Many plants are now using Negro women for the first time. Experience has shown they are, in the main, satisfactory.

Even though steelworks have completed their manning tables and have been given replacement schedules by their state selective service organizations, these are actually only time tables. They say when essential workers will be taken. They give no assurance whatever that large groups of supposedly essential men may be retained in steel production.

This means every essential worker who is under 38 years of age, even if he is a married man, must consider that he may be wearing Uncle Sam's uniform before the end of this year. It also means that steelworks must prepare to replace these men, and that as speedily as possible.

Facing this necessity the metal producers of the midwest, where labor shortages are most acute, have turned to women and are hiring them in ever-increasing numbers. Some competent men believe that by the end of this year 15% of the total personnel of mid-western steelworks will be women. Even so, this will fall far short of the Russian proportion, which is understood to be 30% and even more in some cases.

There's even a bit of humor in the situation. One producer of forgings in a mid-western city recently hired more than 50 women to do general labor work. A few days later the shop witnessed the spectacle of a comely girl weighing less than 120 pounds wheeling a heavy forging to a testing bench while a burly drop forger twice her weight walked alongside grinning, to witness the tests. This procedure, required by union rules, was enjoyed by ~~the~~ most everybody save the girl, a C.I.O. member, as the forgers in that plant are A.F.of L. men.

New York Times

March 29

GARY WORKS HIRES WOMEN IN ALL JOBS

2,600 out of 23,000 employes, with some even in open hearth, long a man's domain.

POLICEWOMEN WIN PLACE

Aim Proves Deadly in Gun Drill--Technical, Inspecting and Heavy Posts are Filled

Chicago, March 29--The open hearths and blast furnaces of the Gary(Ind,) works of the Carnegie Steel Corporation for the first time in thirty-five years have admitted women.

There are 2,600 of them among the 23,000 persons employed in the Gary works and the adjoining armor plate plant, which is operated by Carnegie Illinois for the Army.

Women can be found in almost all departments. They are working as laborers and in more technical jobs. For instance, in the open hearth, which has always been regarded as man's domain in the steel industry, women are operating transfer material cars and serving as test carriers, delay clerks, ingot shippers, not to mention transfer car operators, metallurgical observers and carbometer readers.

The carbometer is an instrument which provides for the quick determination of the amount of carbon in the heat of steel.

Women are serving as policemen, patroling the huge areas of the plant. They have been sworn in as auxiliary military police, and their male counterparts who watched them drill admit that their aim is deadly.

A number of women at the Gary works are employed in the rail mill, where an ingot a shape of steel, is converted by eighteen passes into a rail. They are working as cover crane operators, steel chasers expediting delivery, stampers, hot bed operators, inspectors, helpers on light rails and hookers.

Many of them came out of their homes and into the mills as their husbands went to war.

At present, 35 per cent of the employees in the armor plate plant are women, and it is believed that if the war continues long this may rise to nearly 50 per cent. Hot slabs are rolled into finished plate, ready for heat treating in preparation for tank construction.

The women in armor plate are crane operators, flame cutters, checkers,inspectors, hot-bed operators and level operators.

In the Gary sheet and tin mills of Carnegie Illinois, 450 employes are women. They are doing such jobs as assorting tin plate, operating overhead cranes and assorting gas washers, which filter gas. They are aiding in the finishing of heavy plate for tanks, landing mats, deck plates, steel for cartridge cases and other war materials.

In the American Bridge Company's Gary plant, 150 women are welders, timekeepers and inspectors, aiding in the fabrication of steel for aviation, naval and other war purposes. All the plants are United States Steel Corporation subsidiaries.

From Plain Dealer
Cleveland, Ohio
May 2, 1943.

STEEL MILL JOBS GOING TO WOMEN

Republic Finds Women Sex Learns Rapidlay

by Donald C. Schneider

The steel industry, traditionally the work of men since before Longfellow wrote the "Village Blacksmith" has turned to the employment of women because of the loss of men to the war. And, to the surprise of all cynics, reports indicate the so-called weaker sex is more than holding its own.

"The employment of women in steel mills was nothing less than a revolutionary step," James L. Hyland, Cleveland district manager of Republic Steel Corporation, said yesterday. "Many steel men were extremely doubtful as to the value of women in this entirely masculine industry.

"However, the women Republic has hired here and elsewhere, I'm told, really take their jobs seriously and as a result they learn rapioly. After instruction they do the work assigned to them in an exceptionally able manner."

From 585 to 5,842

As of April 1 Republic's employment totaled 5,842, excluding office help. This represents a little more than 9 per cent of the corporation's total personnel. The rapid flow of women into the industry is realized when this figure is compared with 585, the number of women employed by Republic only last October.

I t is estimated the percentage of women in steel work throughout America is about the same as Republic's. This number is significant when one considers that in England, according to a recent report of a Republic Metallurgist, the percentage of women in the entire steel industry is only about 13 after the country has been at war nearly four years.

And in Russia, where since the Red revolution women have prided themselves in doing men's work, the percentage of women in the steel industry is only approximately 30, according to estimates.

Serve as "Hot Chain Men"

In Cleveland, including the Corrigan-McKinney plant of Republic, there were 557 women employed as of the first of last month. Jobs held by these women, who have replaced men fighting in the armed services, include such tasks as crane operators, welders, acetylene burners, inspectors, loaders, production recorders, steel sample testers, lathe and other machine operators, yard clerks and even "hot chain men."

It was pointed out by Republic officials that over-all employment figures for women included workers in both steel plants and in manufacturing divisions of the corporation.

Since last fall several manufacturing plants have been re-equipped for aluminum work for aircraft.

For instance there are 515 women and girls employed at drilling and riveting aircraft units in the Berger plant of Republic in Canton.

In the matter of training women and girls for the operation of machines, Republic

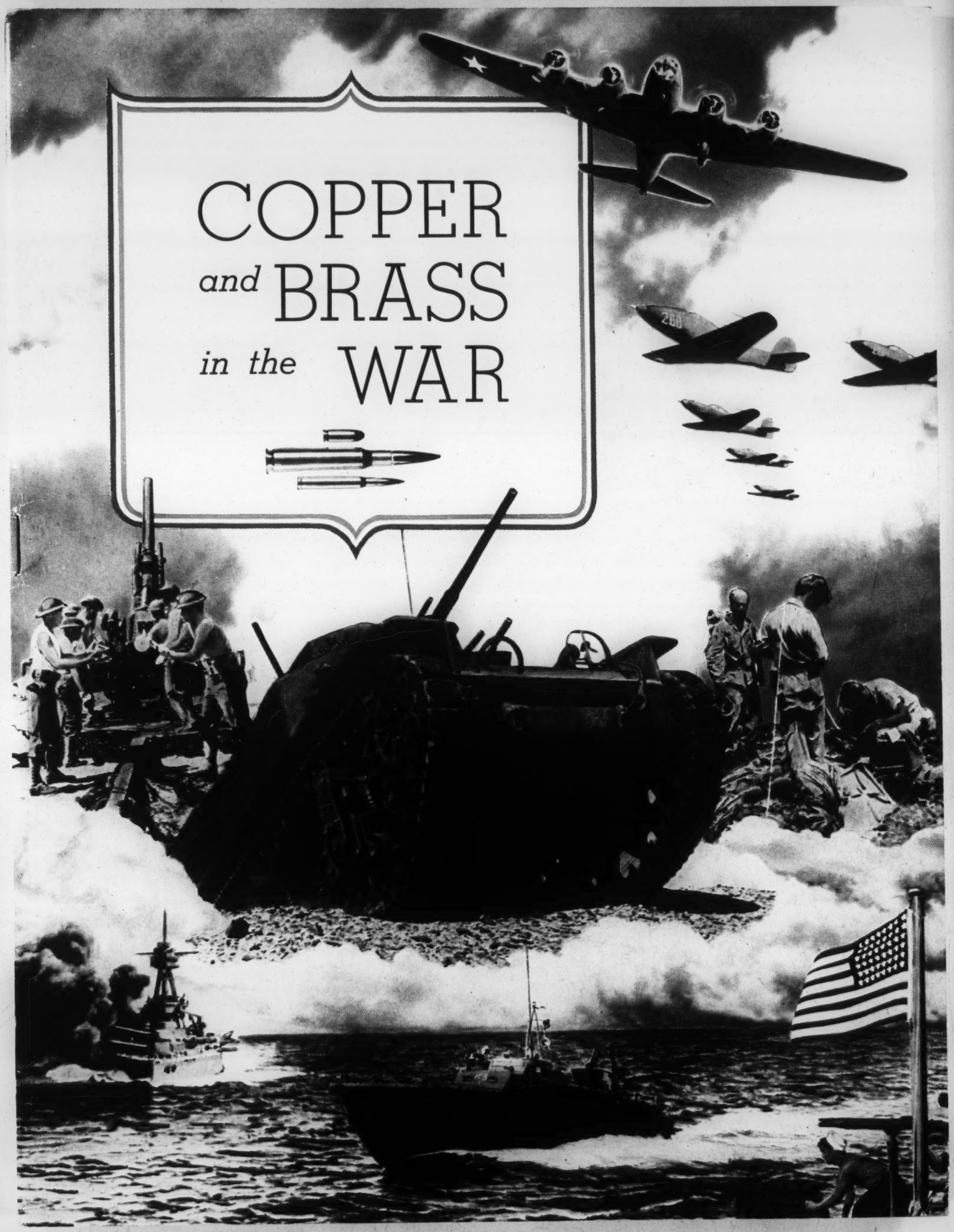
officials have devised a system which has been very successful. It calls for concentration on only one part of production; that is, a complicated job is broken down into several relatively simple processes, only one of which is taught to a trainee.

Not only has this procedure been employed successfully in machine shops, but it is also followed in technical laboratories where persons with little or no scientific education are doing specialized work.

But perhaps the best tribute to women workers at Republic was made by Hyland when he asserted:

"A considerable number of woemn are working here not because they need the money so badly, but becauce they know they can make a real patriotic contribution to the war effort of the United Nations."

COPPER *and* BRASS *in the* WAR



COPPER & BRASS RESEARCH ASSOCIATION Bulletin

NUMBER 125 JUNE, 1943

Credit lines for illustrations on the photomontage cover:

Tank, U. S. Army Signal Corps; A B-17E Flying Fortress, Boeing; Group of Airacobras, Bell Aircraft Corporation; Anti-Aircraft gunners, U. S. Army Signal Corps from Acme; Signal Corps, Acme; Battleship. U. S. Navy; P. T. Boat, Acme; Coast Guard boat dropping depth charge, U. S. Coast Guard from Acme.

Copper MINES

breaking output records

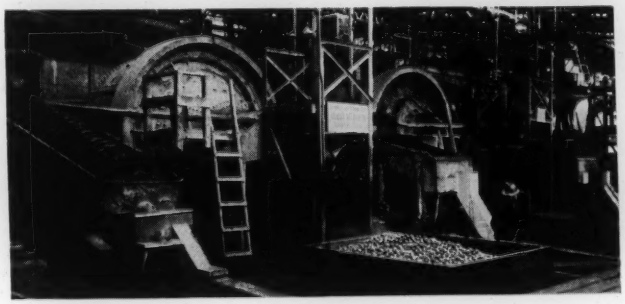
COPPER, Man's oldest and most useful metal, both in War and in Peace, was withdrawn from the field of commerce after the treacherous attack by the Japanese on Pearl Harbor and is being used exclusively for War armament. The great Copper mines of the United States, Mexico and Chile are operating day and night to supply this vital metal to the fabricating plants which are also working day and night to turn out munitions and other War armament for our country and her allies. All mine output records are being broken.

It is the purpose of this special issue of the Bulletin to portray the importance of Copper and Brass to the winning of this Global War for the United Nations.

Above—View of enlargement of reduction works of a mining company in Arizona sponsored by United States Defense Plant Corporation.

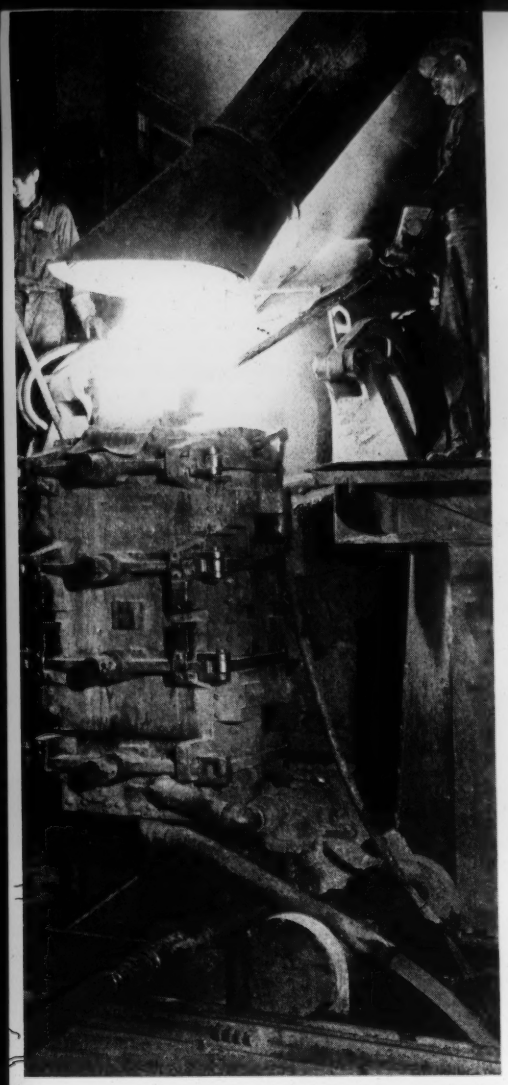
Right—Mining Copper a mile underground in a mine in Northern Michigan where the red metal was worked by the Indians before the discovery of the New World by Columbus.

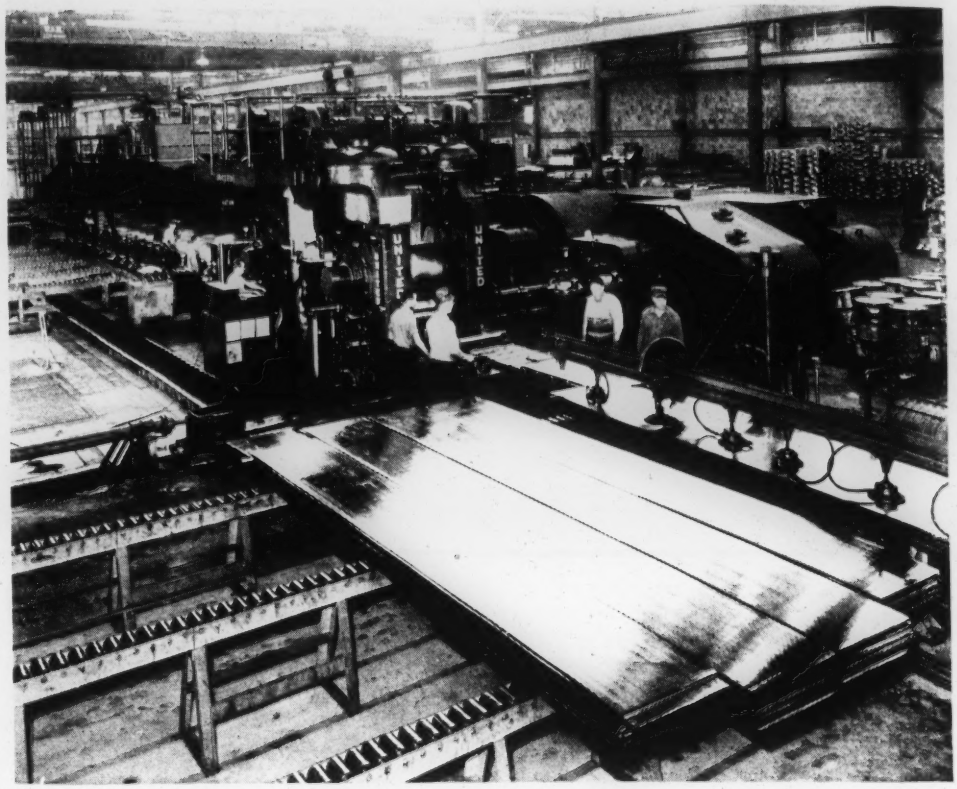
Below—Ball mill grinding ore from a Montana mine. These balls of steel with water pouring through crush the ore and it becomes as fine as sand through this modern process.



Below—Largest open cut Copper mine in the United States is located in Utah.

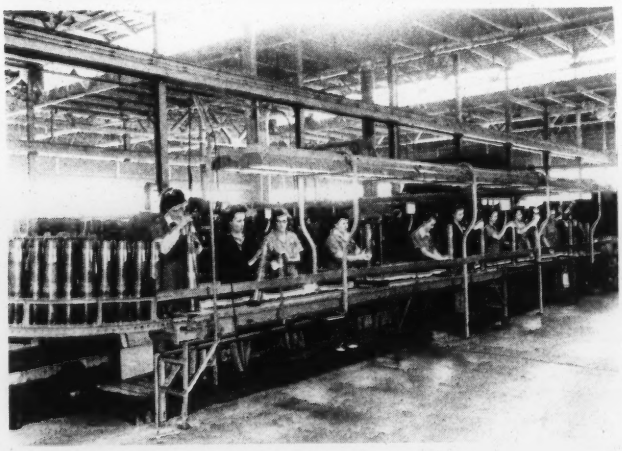
FABRICATION plants are su





Above—Molten metal being poured from a furnace at one of the new plants constructed by a large fabricating company in the Midwest.

Right—New Brass rolling mill and cartridge case plant in operation ten months after ground was broken supplies munition factories.



Above—Women employes of one of the large fabricating plants making final inspection of Brass cases for artillery shells which will be shipped overseas to our armed forces and those of the other of the United Nations driving for an invasion of enemy territory in Europe and the Far East.

OPERATING 24 HOURS A DAY the Brass fabricating plants of the United States are turning out War Armament for our fighting forces on land, on and under the sea and in the air. Every pound of Copper mined in this country and imported from Mexico and South America is being fabricated into equipment, not only for our armed forces, but those of the other United Nations fighting on all fronts in the most savage war fought since the beginning of time. Despite the submarine war by the Axis the United States is landing its war materials overseas.

Not only are Brass cartridge and shell cases being turned out by the millions each day but these plants are also supplying the necessary materials to the automotive and other peace-time industries that have been converted for all-out War Armament. Copper and Brass are essential in the construction of all types of battleships and merchant ships, tanks, airplanes, trucks, jeeps, machine and Tommy-guns and for ammunition. There are many other essential uses for these metals for the sinews of War. That is why for the duration few peace-time products which for satisfactory performance require Copper and Brass in their construction will be available. This is a sacrifice the American people are gladly making to provide our fighting men with the most modern equipment to defeat the Axis hordes who would destroy the American way of life.

supplying Sinews of War for the United Nations . . . .

Above—Brass fabricating plants similar to the one shown, which is almost a mile long, are turning out more War Armament than was possible in World War I.

Above—Women are employed to inspect Brass cartridge cups for imperfections as they are carried along the line on a conveyor belt.

Above—Rolling mills supply cartridge Brass for small arms ammunition; Brass rod for ordnance fuses and alloys needed in the construction of our fighting planes.

Above—Operator feeding strip Brass into a press which cuts and draws two blanks at a time for 30 caliber cartridge cups.

Above—Blanking, inspecting and packing Brass cartridge discs at one of the large Brass fabricating plants in the East. These discs are used to make various size cartridge cases for the Army and the Navy.

BRASS MILLS

have answered Nation's call for necessary war material...

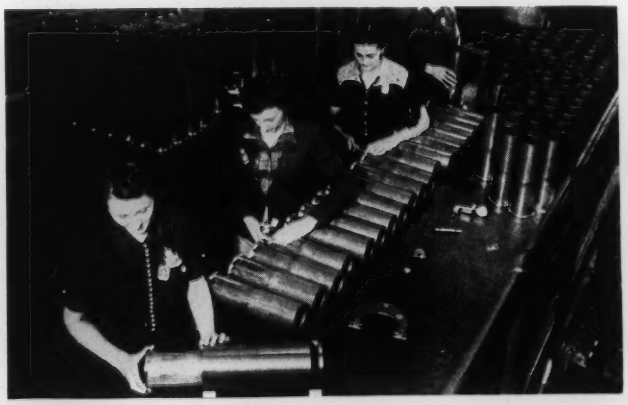
FROM THE TIME the Colonies revolted against British rule Copper and Brass have been fabricated into War Armament for use against the enemy in all the Wars in which this country has engaged. The first rolling mill was established in New England and from that time on that section of the United States has been the hub of the industry, although today mills are operating from the Atlantic to the Pacific.

Never before in the history of our country have the Brass mills been geared to such mass production. Some idea of the necessity for this metal in war production can best be gleaned by citing some statistics on its uses. For instance there are more than 2,000,000 pounds of Copper and its alloys in a battleship while destroyers, cruisers, submarines and other types consume the metal in about the same ratio to their size. Copper and Brass are corrosion resistant to salt air.

Small arms ammunition is the largest consumer of Brass. Artillery and Anti-Aircraft guns are fed with Brass cases.

A giant bomber contains about 1,000 pounds of Copper and Brass and its machine guns fire 300 rounds a minute. It takes seven tons of Copper for one minute of combat by 50 fighter planes. There are about 2½ miles of Copper wire in these skyfighters. Tanks, the clanking steel monsters, have a Copper and Brass content of more than 800 pounds each while a 37 mm. Anti-Aircraft gun uses a ton of Brass every 20 minutes it is in action.

Right—With a shortage of men who have joined the fighting forces an army of women are now working in fabricating plants throughout the Nation. This young girl is one of many who are inspecting Brass cartridge discs.



Above—In this Midwestern Brass fabricating plant men and women work together in carefully making line inspection of cases for artillery shells which are used for training troops and against the Germans, Italians and Japs.

Below—View of a Midwest tube mill turning out equipment for munitions of war.

Right—Sailor George Sunderland, visiting his father.

Above—Robert Schieder, Radioman Third Class, with his father at an Eastern mill.

Below—Edward Borowski, a machinist mate with his father employed at a Waterbury Brass mill.

FURLOUGH granted,

men return to visit relatives...

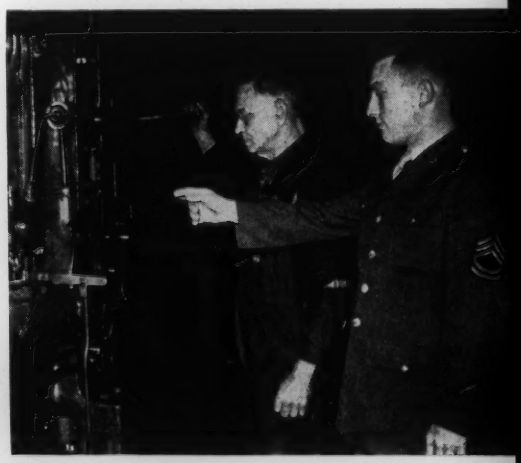
SEVERAL THOUSAND young men employed by the Brass Mills are now serving in the armed forces. Many of them are on active duty in all theatres of the War while still others are training in the States for overseas action. Many fathers, wives and sweethearts work in the mills in which the service men were employed before joining the colors. They are "passing the ammunition," to defeat the Axis forces in the European and Far Eastern fronts.

When most of those serving in this country obtain furloughs they either fly or go by train to visit relatives in the home town, and of course, go to the mills where they were employed. On this page are shown a few of these young men with fathers, wives and former employers at some of the Brass Mills located in the Eastern states.

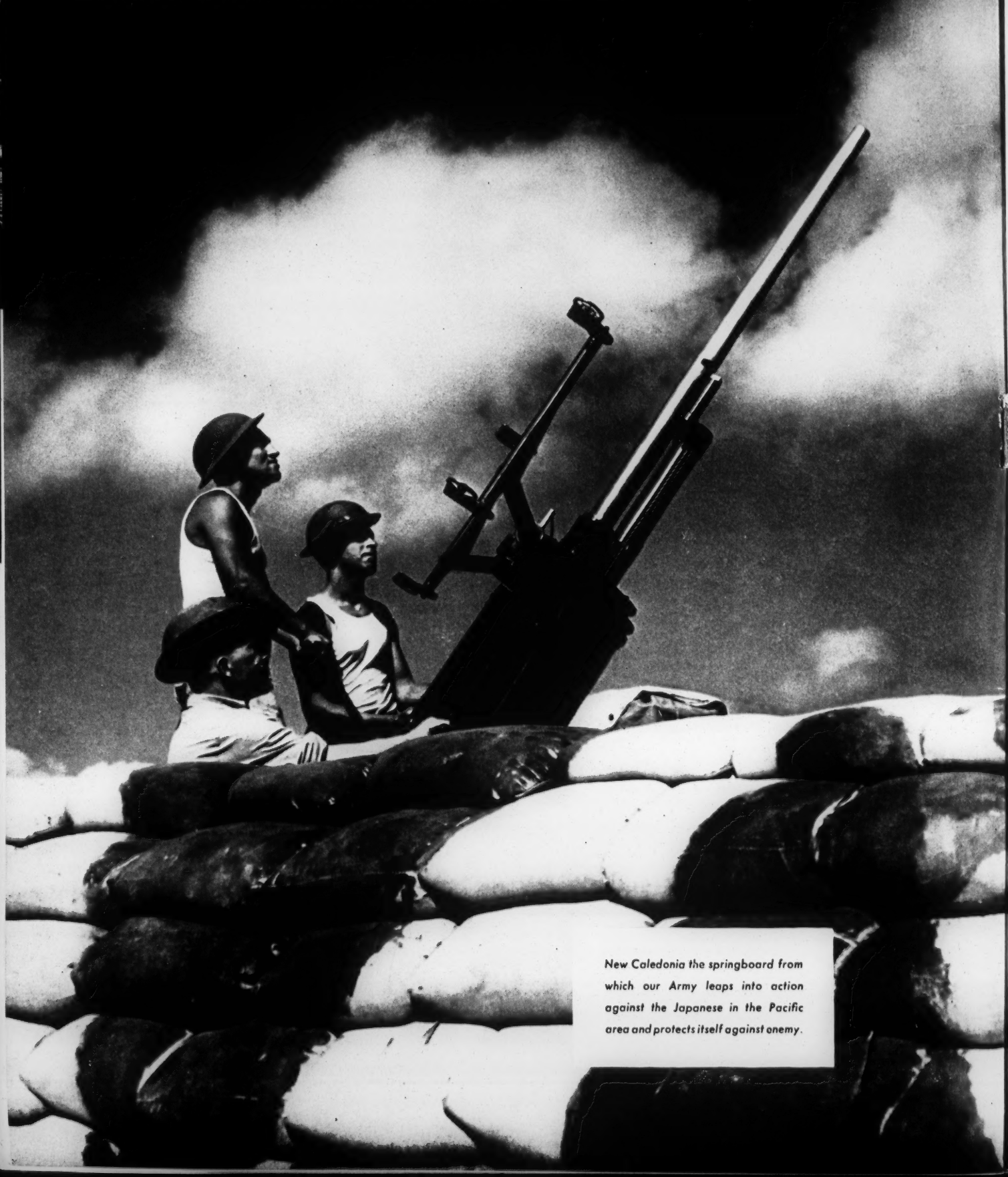
Below—Lieutenant Chas. Duncan, hero of a crash landing.

Below—Cadet Wm. Powell with Mrs. Powell.

Below—Sergt. B. Murice visitis father in a mill.



Tanks and Guns of the ARMY hurling back



New Caledonia the springboard from which our Army leaps into action against the Japanese in the Pacific area and protects itself against onemy.

Axis hordes on all fronts

AMERICAN TANKS have proved superior to those of the Axis Powers in this global war. These tanks and tank killers are one of the major factors that caused the defeat of Rommel's Africa Corps. They were used both by the American and British forces in Africa. American tanks are proving a deciding factor in the Russian drive against the flower of Hitler's army and the Japanese have found them a deadly weapon against their invasion of the territory of United Nations in the Far East.

After these tanks are thoroughly tested they are shipped to all fighting fronts as fast as convoys can carry them. The output of these monsters in the United States is rapidly exceeding that of Germany, Italy and Japan combined. Here again Copper and Copper alloys are playing their part for each tank contains almost a thousand pounds of these metals. They are equipped with Howitzers and automatic guns which fire ammunition made with Brass cases.

Robert Patterson, Under Secretary of War, in a recent statement summed up in a single sentence the importance of Copper and Brass in this mechanized war when he said: "An Army without Copper, would be an Army without speed, maneuverability, communications, or fire power—it would not last a day in battle."

American owned mines produce more Copper than those of all other Countries in the World.

Above—One of the newest tank killers, an M-7, given the acid test for desert warfare in maneuvers in California. It is equipped with a 105 Howitzer and a 50 caliber automatic machine gun. (Photo U. S. Signal Corps)

Below—Their guns spitting fire, Uncle Sam's anti-aircraft gunners in Puerto Rico protect the base where giant bombers are held ready to take off and guard the eastern approach to the Panama Canal. (Acme photo)

Above right — One of the Tank Killers which was a big factor in rout of Rommel's Afrika Corps. Neither the German or Italian tanks proved a match for these monsters. They are now in action on all fighting fronts for the United Nations. (American Locomotive photo)

Right—Australian troops with an American built tank in action at Papua. The machine guns of the tank fired over 10,000 rounds of ammunition in one morning against the Jap forces. American tanks and other War Armament have been a great aid to the Aussies. (O.W.I. photo)

Left—Coast artillery protect our shores on both the Atlantic and Pacific oceans, as well as all the possessions in which the Stars and Stripes fly. These big guns have a range that makes it impossible for Axis ships to enter the harbor they guard, in an effort to land troops. This gun guards Puerto Rico. (U. S. Signal Corps photo)

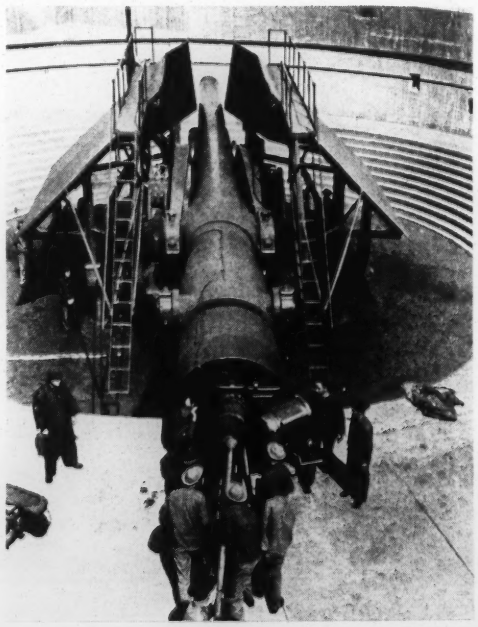
Giant GUNS are in action against the enemy and

FROM MAINE TO FLORIDA, along the Gulf and from Canada to Lower California the coast lines of the United States are guarded from enemy invasion by the largest batteries of heavy artillery ever placed in position by a fighting Nation. These guns have a range that make it possible to score direct hits on Axis battleships long before they can approach close enough to our shores to shell, with any effect, its bases.

Such guns have been placed in position to guard the Panama Canal and other possessions of the country outside the confines of the States. Large guns saw action in Africa and are now being used against the Japs in the Far East. Ammunition for the guns use both Brass and steel cartridge cases; projectiles having Copper rotating bands. The crews of these big guns are all expert marksmen. They are drilled each day to guard against any surprise enemy attack. The Coast Artillery is one of the great bulwarks of our Nation.

Left—American fighting forces on Guadalcanal fortify themselves by bringing up field guns and anti-aircraft to be prepared against an attempt to land troops. This 155mm Howitzer is ready to go into action against the enemy who was driven from Island after one of the hardest battles fought in the Far East. The Japs had expected to use the island as a base from which to bomb and invade Australia. (European photograph)

Below left—A gun crew of artillery drilling in Iceland where many American soldiers are now stationed to guard against enemy attacks. Anti-tank guns are ready for the enemy in the event of a raid.

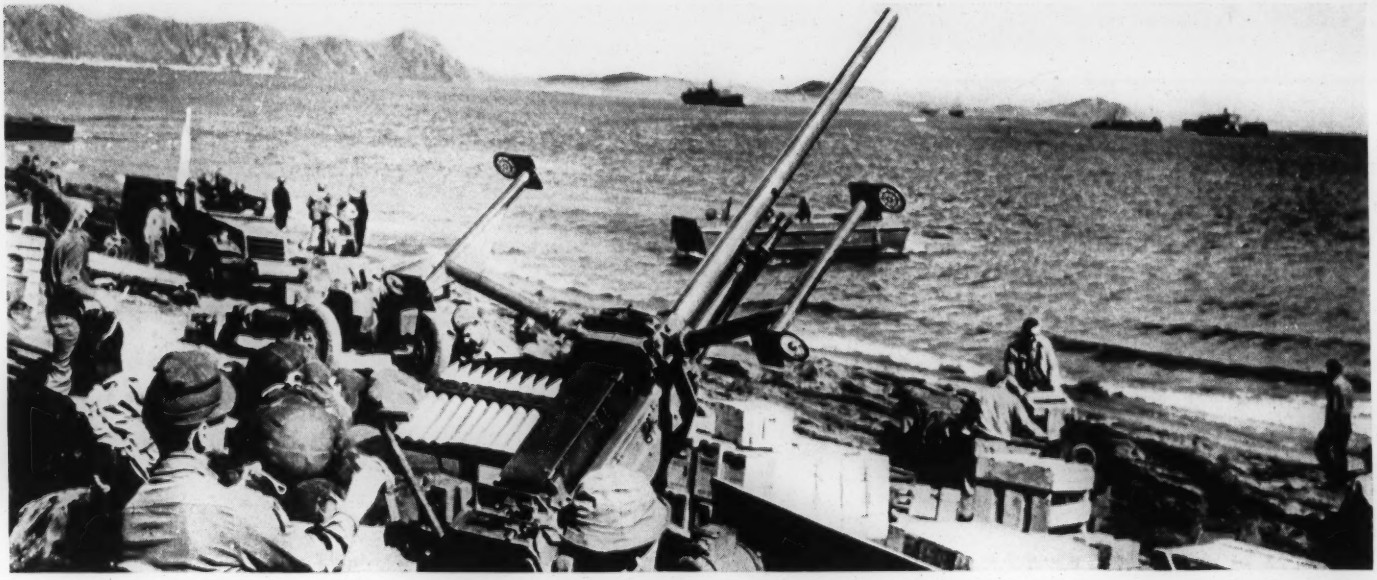


Right—One of the large coast artillery guns on the Atlantic seaboard with its crew ramming in a 16-inch shell. These guns have a long range and are ready for action. (Monkmeyer)

Left—U. S. Task Forces with the Australians defeated the Japanese, who lost 15,000 men in the fighting at Buna, New Guinea. This marked the end of a threat by the enemy in its march on Port Moresby, which is close to Australia. (Photo by U. S. Signal Corps)

Right—Waacs meeting Spahis in Northern Africa. These girls were the first to go overseas after enlisting in the U. S. Army. (Acme)

guard our coasts from attack . . .



Above—A task force of transports and other vessels depart from Dutch Harbor, Alaska, to land on Islands of the Andreanof group. On the second day after arriving on the Island the beach was jammed with equipment and all kinds of rations, but it was quickly removed to sheltered sections. This 37mm rapid fire AA gun was among many set up on the beach to protect the troops against enemy attacks from the air. The most eastern base of the Japs is close to this group. (U. S. Signal Corps)

Right—Hawaii is guarded by Coast Artillery and the enemy will find a warm reception in the event of an attempt to land troops on its shores or bomb its cities by plane. This gunner is firing a Howitzer. (Signal Corps)

Planes and ships of the NAVY are blasting enemy

During the winter and spring the United States Navy has inflicted heavy losses on the enemy transports in the Mediterranean and the Pacific

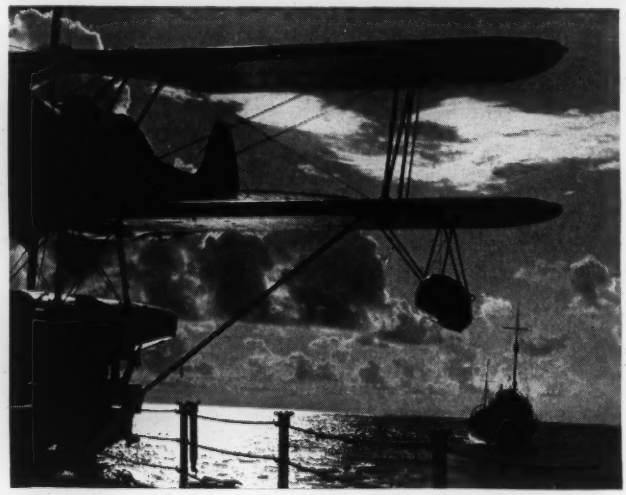
convoys carrying troops . . .

NAVY SHIPS AND PLANES aided by big Army bombers have been largely responsible for holding the Japanese at bay. When the Yellow Peril, by an act of treachery, at Pearl Harbor declared war on the United States the Nipponese started their drive to capture the islands of the Pacific and invade Australia. They soon found that their battle fleet was no match for the United States Navy and suffered a disastrous defeat in the Coral and Bismarck Seas. This was the worst defeat to date the Japanese have suffered in the Pacific Ocean.

Reports from the Pacific theatre of war state the Japanese are massing another great fleet to make another attempt to invade Australia. Each time their ships have attempted to aid in setting up new bases to transfer troops and war armament they have been driven back by our Navy which is each month receiving large reinforcements. That another major sea battle is imminent is the opinion of Navy men who are confident of a most successful outcome. If the Japs are held back from the shores of Australia during the summer there is little to fear from their being able to inflict a critical defeat on the United Nations in the Far East. The losses of the enemy have been enormous.

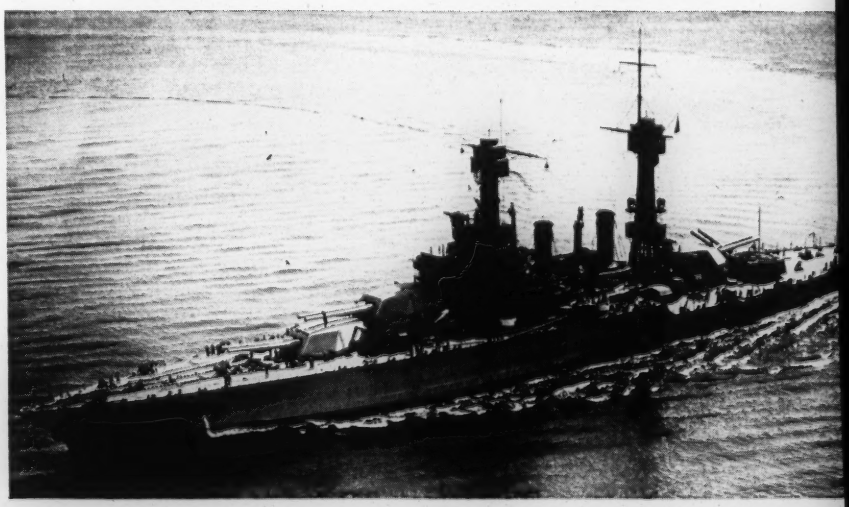
Navy and private shipyards of the United States are working day and night to turn out more fighting and cargo ships. These are sliding down the ways as fast as men can build them. The demands of the Navy for Copper and its alloys to build its sea fighters is being met by the Brass fabricating plants of this country. More of these vital metals are being used by the Navy than ever before; more this year than perhaps during all the time we fought in World War I.

Above—One of the great aircraft carriers of the Navy with P.T. boats "Somewhere in the Pacific." Both have played a most important part in the victorious fight against the Japanese forces on both sea and land. (Acme)



Right—Silhouette of a destroyer under the wings of a ship based plane in the Pacific Ocean near Australia. Navy aviators are superior to Japs. (U. S. Navy)

Left—From the deck of a battleship another one is shown maneuvering into position. These ships are guarding Australia from an invasion by the Japanese forces. (U. S. Navy photo)



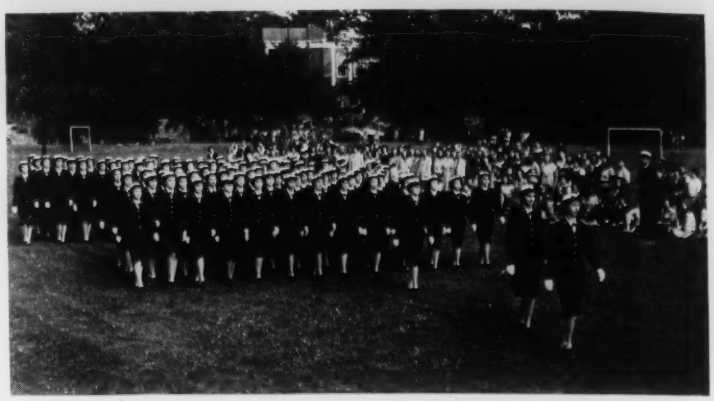
Right—The Colorado is one of the Navy's new battleships in action but her location is a military secret. Navy officers and men are eager to engage the enemy. (U. S. Navy)

American fighting ships are in action on the

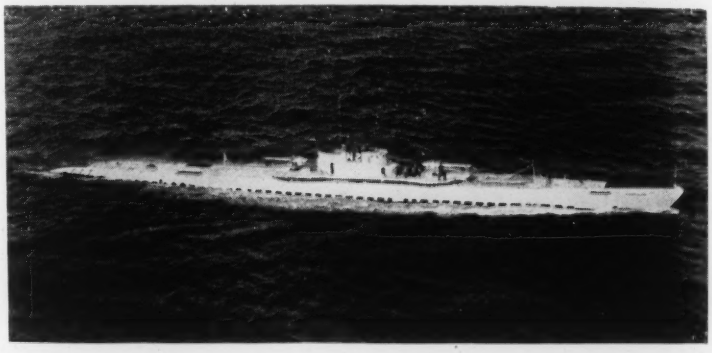
WHILE THE NAVY is checking the advance of the Japanese in the Pacific the Atlantic fleet is also performing a herculean task. Hundreds of thousands of American troops have and are being safely convoyed to Africa. The Navy also protects the merchant ships carrying war armament, not only to our own forces but to those of other United Nations, including Britain, Russia and the Free French. Large quantities of food stuff to feed these armies and workers are also being transported safely overseas to Africa and to the northern ports of Russia.

Millions of rounds of machine gun and Tommy-gun bullets with their Brass cartridge cases are included in each cargo. Thousands of tanks and planes are also being shipped. Large artillery guns and their ammunition of Brass and steel are being transported. In the successful battle against the Axis in Africa the United Nations have fed meals of millions of pounds of ammunition to Rommel's soldiers.

The one disappointment to Naval officers is that neither the Germans or Italians are willing to come out of their sheltered bases for a knock-down battle. The Italians have a great fleet, larger than the Germans, but they are afraid to meet the United Nations.

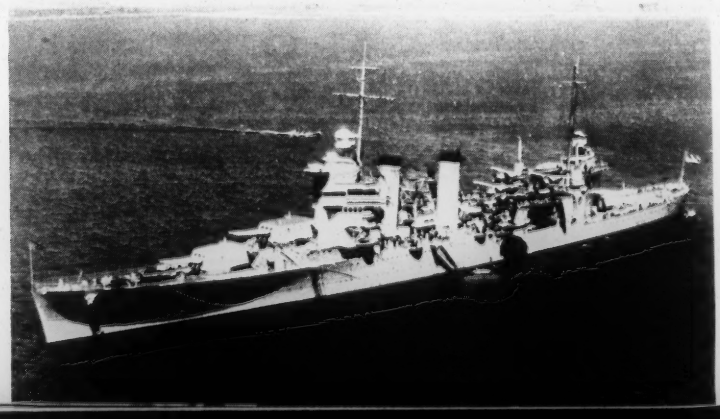


Above—The Waves, the woman's auxiliary of the United States Navy, are now in service at all important bases on both coasts and the Gulf of Mexico. A detachment is shown drilling on Smith College Campus before being assigned to posts. (Acme)



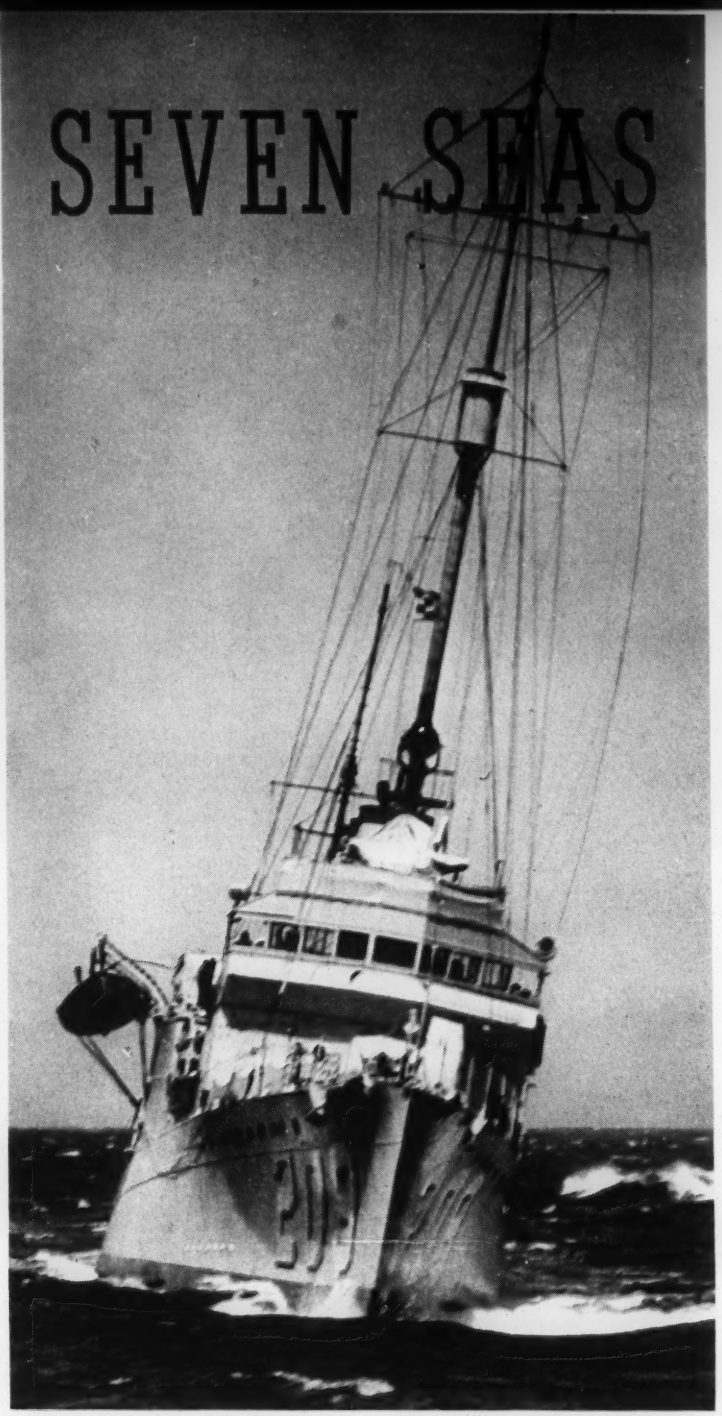
Above—Submarines of the American Navy and her Allies are sinking Axis ships attempting to convoy troops, munitions and food in an effort to hold positions both in Europe and in the Far East. This is the Nautilus, one of our newest type of submarines. (U. S. Navy)

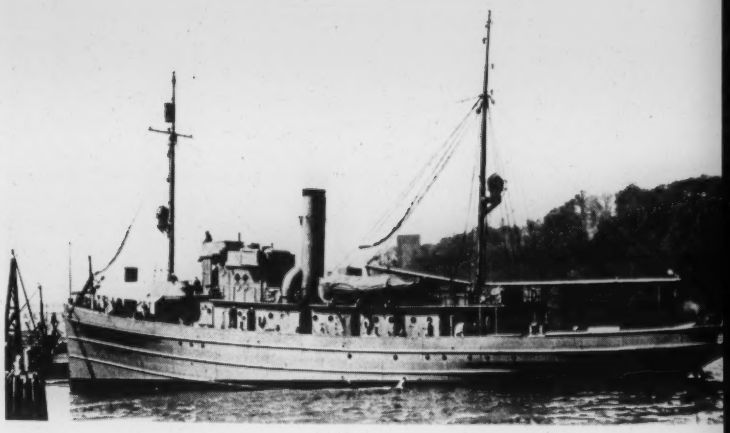
Below — One of Uncle Sam's heavy cruisers which are protecting ships carrying war armament and food to our troops fighting the Germans, Italians and the Japanese. They took a heavy toll of Jap vessels in the important naval engagements in the Far East. (U. S. Navy)



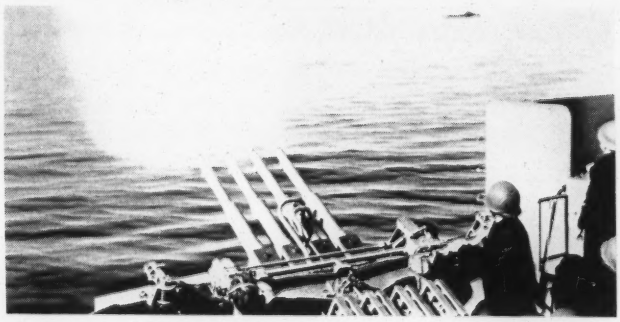
Below—This remarkable photograph by the United States Navy shows a depth charge fired from a "Y" gun by a PC boat patrolling the coast. These speedy sub-chasers are helping cut the submarine toll.

SEVEN SEAS



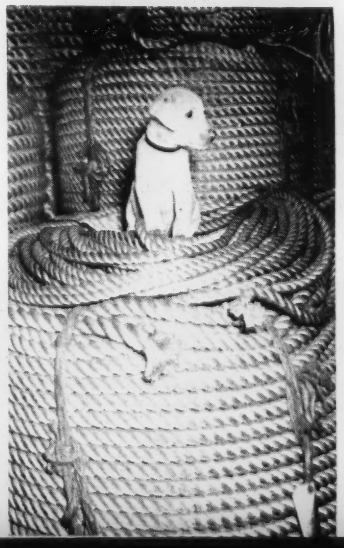


Above—The U. S. Tern, one of a fleet of minesweepers used by the Navy to safeguard our ships from enemy laid mines. (U. S. Navy photo)



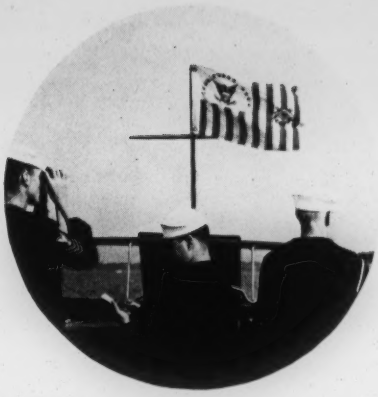
Above—Light cruisers patrol the American coasts on both oceans and are also used to convoy the merchant ships carrying supplies to our armed forces and those of other United Nations fighting the Axis armies. (U. S. Navy photo)

Right—This boatswains mascot seems a little uneasy while watching a training class of sailors at a Navy sub-chaser school in Miami, Florida. The photo was taken by a Navy photographer.



Above center—Always on guard while operating in hostile waters crew of a convoy ship mans this Bofors twin-mount anti-aircraft gun. The guns are used against low-flying aircraft as the ships approach the shore to unload cargo and troops. Many enemy planes have been shot down by these rapid fire guns. They were very effective in the successful landing of the American troops in the African theatre. (Photo U. S. Navy)

Above—Firing from a 1.1-inch multiple anti-aircraft gun, now being used by the Navy on all types of fighting ships. This rapid fire unit can shoot many hundreds of shells a minute and accounted for downing a large number of Japanese planes in the battles of Pearl Harbor, Coral Sea and the Solomon Islands. The British affectionaly call these guns the Chicago Pianos, by which name they are now well known. (U. S. Navy photo)



Left—Keeping a careful lookout for submarines the Coast Guard is on the alert for any attempt by the Axis to land another group of saboteurs.

Large cutters used in submarine

THE FIGHTING United States Coast Guard has and continues to make a record of which it can be justly proud. During wartime the oldest fighting service afloat operates as a part of the United States Navy. The public is familiar with the traditional Coast Guard shore patrols, but knows little of its record in the Solomons, where Coast Guard Invaders battled Japs in landing Marines at Guadalcanal. In North Africa, Coast Guard Invaders landed troops and supplies in their landing barges under constant bombing by Axis shore batteries and planes.

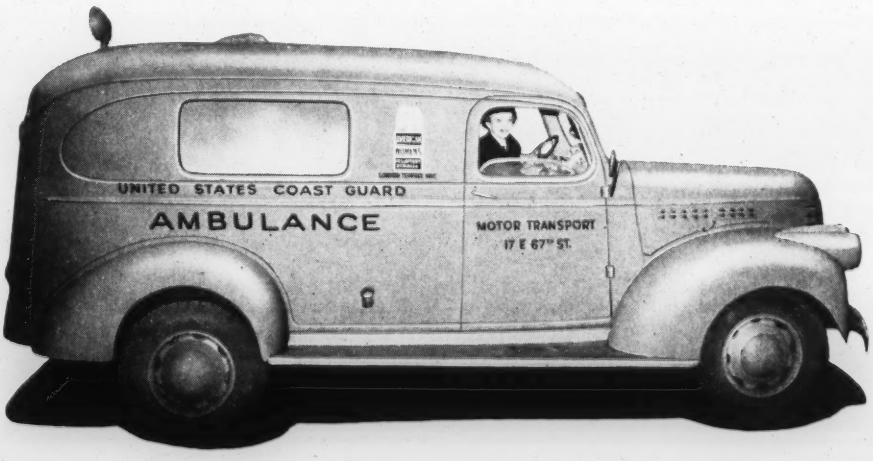
On the high seas, Coast Guard cutters and "sub-busters" help Navy clear sub-infested waters, keeping open our life line of supplies. Typical is the thrilling story of the Coast Guard cutter, "Campbell" which depth bombed a wolf pack of five Nazi subs, rammed and sank the sixth in a running twelve-hour battle while guarding a convoy. Recently released was the tale of the Coast Guard cutter "Icarus," which shelled and sank a U-boat off the Carolinas, capturing 33 of its crew.

Although it is fighting overseas, the Coast Guard still stands watch on 40,000 miles of American shoreline and guards harbors and piers from sabotage. It was an alert Coast Guardsman who caused the capture of the Nazi saboteurs on Long Island, aiding in the arrest of four more in Florida. Six were executed, two others given long prison terms. Now Coast Guard Dogs and Horses of the Mounted Patrol help Coast Guardsman keep a vigilant watch on our shores—ready for any attempted landings. Fighting on all fronts—around the world—the Coast Guard is living up to its motto "Always Ready."

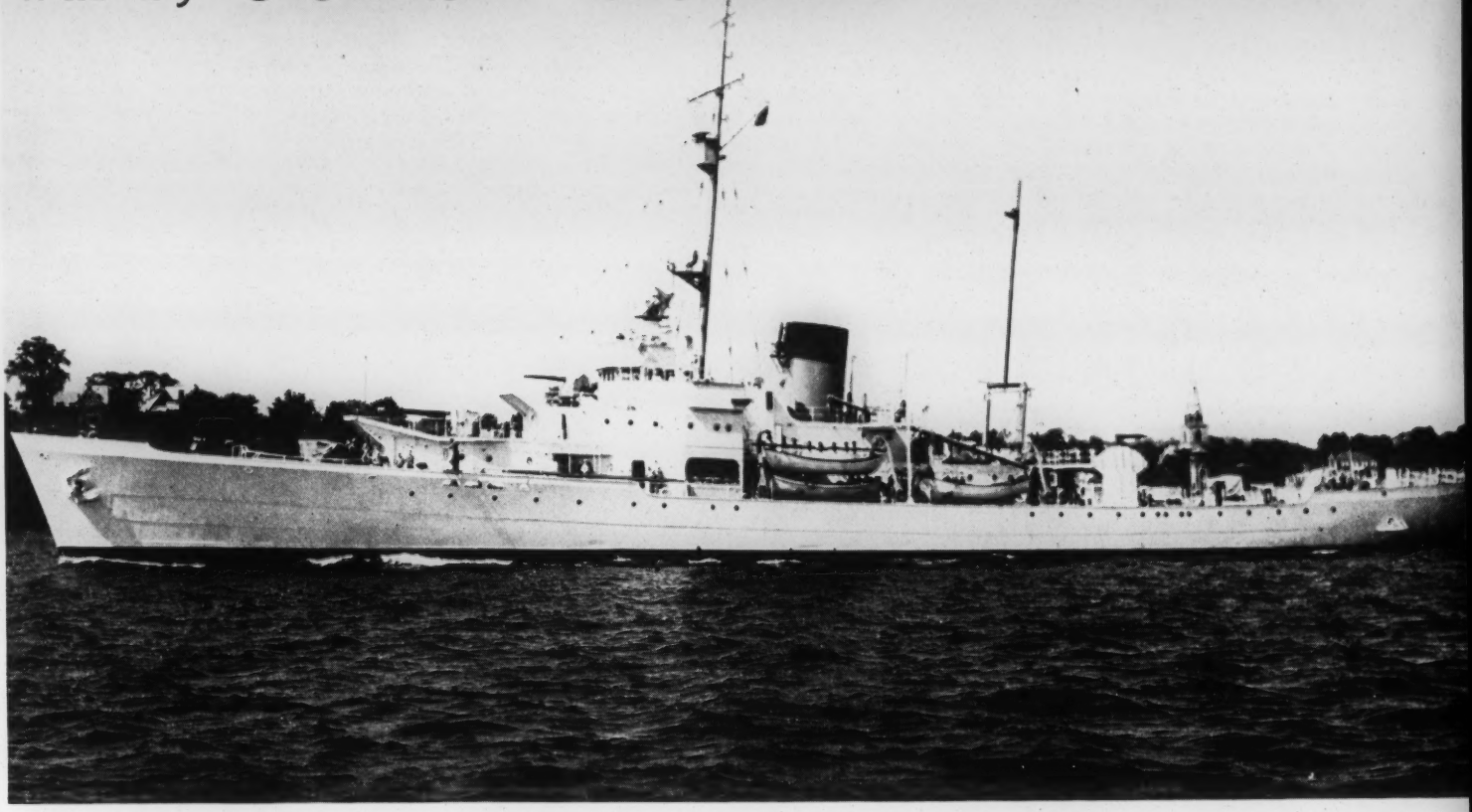
Above—With the nonchalance of long practice, Coast Guard manned landing barges are lowered away as dawn breaks on the horizon in the Southwest Pacific war theatre, to land troops. Coast Guardsmen also participated in landing operations in the North African and Far East theatres. Copper and its alloys are widely used in ship and barge construction.

Below—Operating a small Thrift Shop members of the London Terrace, N. Y. unit of American Women's Volunteer Service purchased for the Coast Guard this ambulance. The Ambulance was immediately placed in service by the Commanding Officer. The London Terrace unit is now starting a drive for Coast Guard Station Wagons.

Below—Coast Guard boats of this type were used in peace-time to patrol the coast during storms. They are now on active duty looking for German and Italian submarines on the Atlantic.



war by COAST GUARD on the Atlantic



Above—A Coast Guard cutter of the Campbell class which routed a wolf pack of six German submarines in the Atlantic on convoy duty. The Campbell dropped depth charges on five of the submarines and rammed and sank the sixth. Although her hull was damaged she was towed into an eastern port.

Above—Reports that enemy sea raiders have crossed the Atlantic has caused increased patrol action by cutters of the Coast Guard.

Below—Spars of the Coast Guard training for duty at New London Academy in preparation for war work. Many are now on active duty.

Above — Members of the new Coast Guard mounted unit patrol deserted beaches along the Atlantic and the Pacific Coasts much more rapidly than it was possible for guards on foot.

Left—Trained dogs are now used by coast guardsmen as they vigilantly guard shorelines of our coasts. Many owners of fine pedigreed dogs have loaned them for this duty for the duration of the War.

Left—A Marine sentry standing in the snow of Alaska to protect that territory from any Jap encroachment.

Left—Marine Private Frank Ma flag he captured on Guadalcan

Jap held Islands taken

SEASONED VETERANS of the United States Marine Corps are writing new chapters in their glorious history. They more than upheld the best traditions of our fighting forces when they drove the Japanese from Guadalcanal and other Islands occupied by the best troops of the enemy. It was at Guadalcanal and Makin that they proved their mettle in driving the Nipponese fighting forces back in their march of conquest.

In Alaska and the Islands nearby the Marines have and continue to prove more than a match for the yellow executioners. With other American fighting forces they are determined to settle accounts with the enemy for its uncivilized warfare during which it shocked the world by putting to death before a firing squad men captured in the historic air raid by General Doolittle and his flying forces. The gallant fighting of the

Below—Along the firing line lieutenants of the U. S. Marine Corps are firing 30 caliber machine guns at the training school near Indiantown, Pa., before being sent to fighting fronts. (U. S. Marine photo)

Right — Paratroopers sit along the sides of plane awaiting the command to jump while in training at one of the California desert schools. (U. S. Signal Corps photo from Acme)

Frank Massaro of Edgewater, N. J., proudly examining a Japanese Marine Guadalcanal. Behind him are Nipponese gas masks. (U. S. Marine photo).

Below—Detachment of Marines start ashore from their landing barges on the beach at Guadalcanal Island in the Solomons. This is one of the several islands the Marines occupy. (Press Ass'n.)

en by MARINES in defense of Australia

Marines has been an inspiration to men and women working in the war armament plants of this Nation. Industry is working day and night to turn out the necessary munitions to keep them supplied in their fight against the enemy.

In the Brass mills millions of pounds of Brass are being rolled to make ammunition for their Tommy guns. Brass shell cases are being made in large quantities for their field guns. Just as fast as these munitions are turned out they are being rushed overseas by convoyed ships. Many employes of the Brass mills are fighting in the Marine corps, and their fellow workers are justly proud of them. Many letters are being received by friends and relatives of these Marines from all the battlefronts in which our forces are fighting. They bring the cheering news that a decisive defeat for the Axis is certain.

Right—Here's a Jap's eye view of a Marine Corps raider about to pull the trigger of a Tommy gun. Jack Goldsmith of Enid, Okla., was with the forces of Lieut. Col. E. F. Carlson which captured many Japs on Makin. (Marine Corps—Acme)

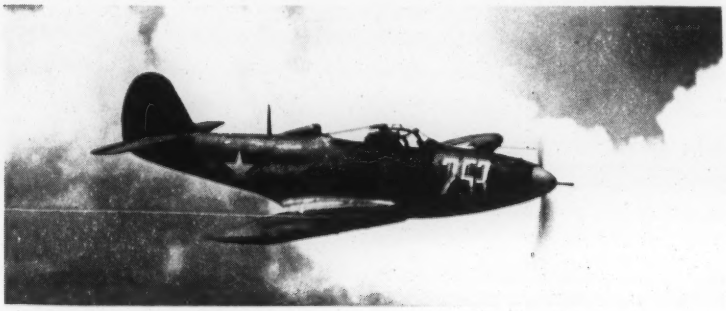
Below—Marine Corps battalions which participated in raids in the Makin and Solomon Islands must learn to shoot from any position. This crouching stance used when running forward to attack. (U. S. Marine Corps—Acme)

PLANES are blasting the enemy

AMERICAN PILOTS, their crews and all types of their fighting planes have proved superior to those of the Axis Powers. In the African campaign American bombers blasted the Rommel forces so utterly that the retreat became a rout with thousands of the enemy killed or captured and great quantities of booty taken. In the Far East our planes have assisted the Navy in keeping the Japanese from further advances on Australia.

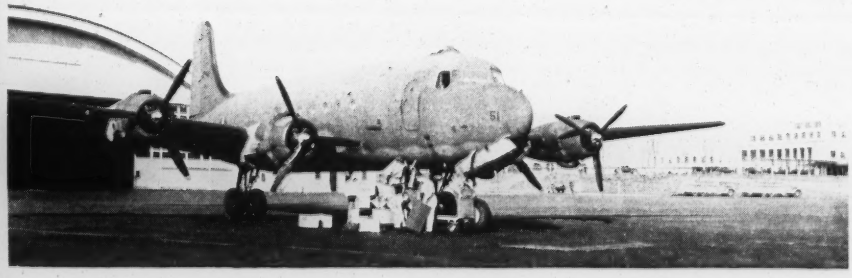
As this is being written all the German and Italian forces in Africa have surrendered. The big bombers are dropping their bombs on other enemy fortifications with tremendous losses both to his men and equipment. They open the way for the British, American and Fighting French to close in for the kill on European fighting fronts. In the Alaskan theatre of war the Japanese have experienced raids which have blasted their fortifications and caused a tremendous loss of life and equipment.

American bombers are making numerous raids on Germany and the conquered countries it occupies. These raids will soon be intensified because Government officials estimate that nearly 100,000 fighting planes will be built this year. These planes have a Copper and Brass content of from 600 to nearly 1,000 pounds each. The Copper wiring in a big bomber is equivalent alone to the wiring in 100 automobiles.



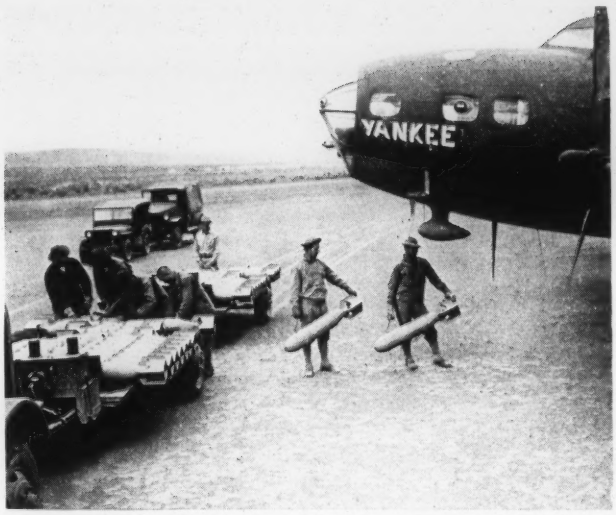
Above—Bell Airacobra flying over a target in Africa. These fighting planes are equipped with a cannon and a full complement of light and heavy machine guns. They are capable of destroying any of the enemy fighting planes

Below left—Loading one of the Army transport planes which are referred to as "Flying Box Cars." These big planes carry freight, mail, personnel and urgently needed materials of war to all fronts. (U. S. Army Air Force)



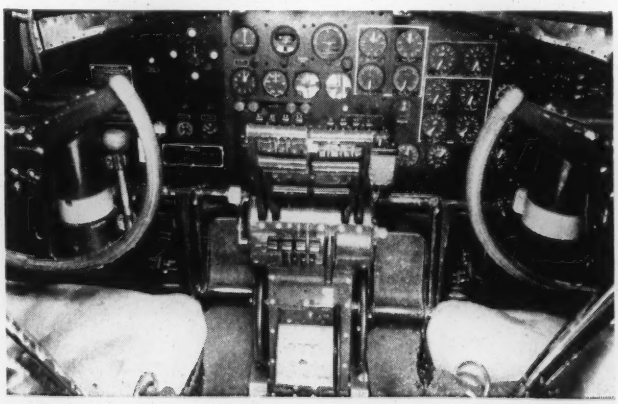
Right — A stratotrainer perfected by Boeing Aircraft Company makes it possible at one time to train an entire crew under high altitude conditions. After this course the flyers are ready to take up a Flying Fortress against the enemy for bombing and fighting both in Europe and the Far Eastern War Zones.

Right—North Americans are fighting the Axis on all the major fronts in this global war. (Army Air Corps)



Above—A "Basket of Eggs" arrive ready to be placed in the bomb bay of a Boeing Flying Fortress. These 100-pound practice bombs have a small black powder charge to show the hit, the rest of the weight being sand. Bomb crews are shown loading up the Fortress.

Above—Ford Liberators are a new type of heavy bomber which are being turned out at Willow Run, Michigan.

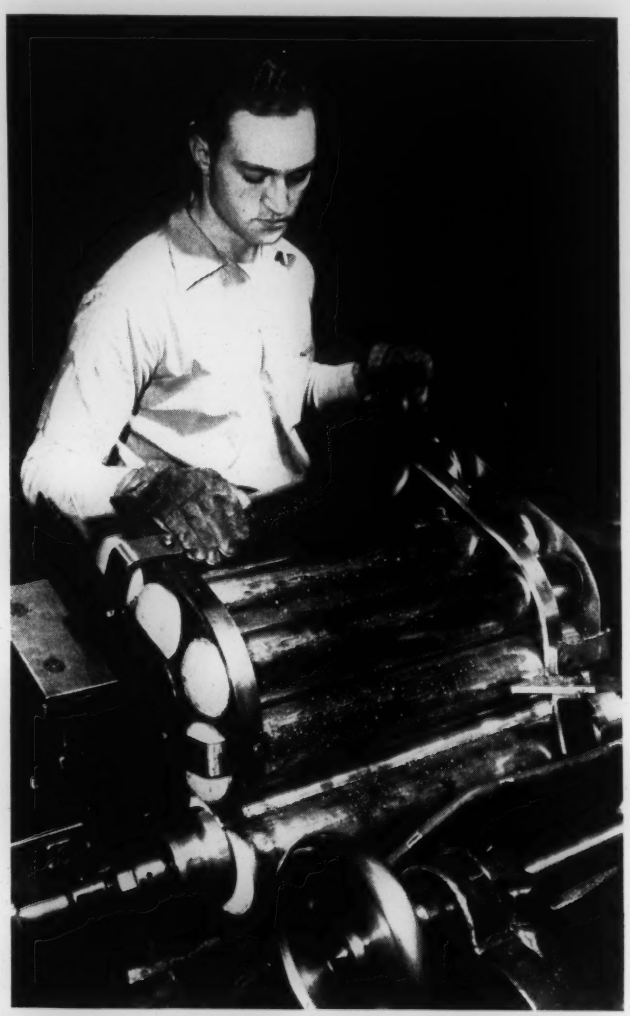


Left—Five members of the Women's Auxiliary Ferry Squadron resting in Texas on a recent cross country flight. These young ladies were peacetime instructors. (Acme)

Above—An instrument panel on a Boeing Flying Fortress. It seems complicated but is absolutely essential to our aviators in navigating the big bombers.

CARTRIDGES and SHELLS

with cases made from Brass are turned out by the millions each week

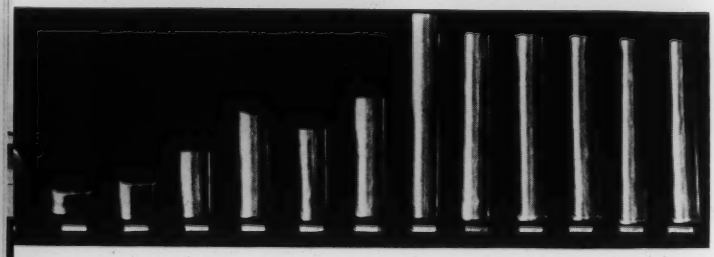


WITH COPPER AND BRASS being used entirely for War Armament many industries making peace-time products for our comforts and conveniences have converted their plants into the manufacture of Brass cartridge cases and other munitions components. This country is now geared up to almost peak capacity and is turning out more munitions by far than Germany is able to produce. The plants are working day and night fabricating into the sinews of war every pound of Copper which is mined.

To keep pace with the war needs of the Nation the Brass fabricating plants are turning out more material in a single year than they did during the time our country was involved in World War I. To meet this demand many new plants have been constructed. They are located in many states of the Nation including the east, midwest and the west coast.

With many men who were employed in the Brass mills and other industries making war equipment now serving in the armed forces hundreds of thousands of women are taking their places. Many have proved as skillful as the men and are being paid the same wages that were paid the men whose places they have filled. Many of these women have husbands, sweethearts and even sons serving in the armed forces and that is an incentive to them to work hard at their tasks and to examine cartridges and shells carefully for any defects.

Below—Women inspecting 30 caliber cartridges in an eastern factory that has been converted from making peace-time products to that of war munitions. Millions of these cartridges with Brass cases are turned out each month by this plant. Hundreds of peace-time factories have been converted to war work for the United Nations.

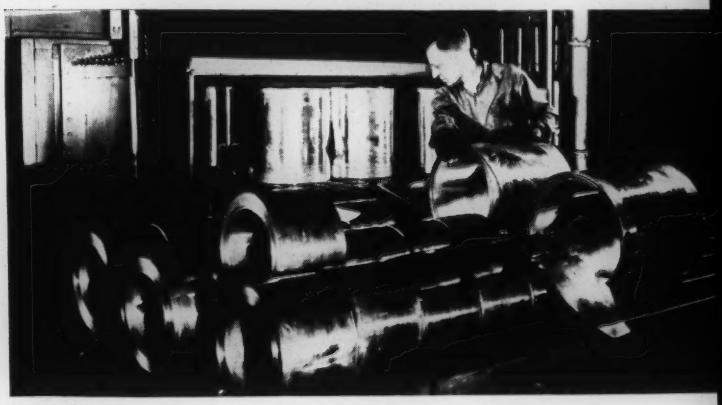


Above top—Cartridge cases for 3 inch anti-aircraft shells are formed by successive drawing operations from a flat Brass disc into an elongated tubular shape with one rounded closed end. (O.W.I.) Above—Showing the stages a case passes from disc, left, to final form. (Armstrong Cork)

Right — Skilled women as well as men are working on Nation's armament in eastern arsenals and in factories. These are 50 caliber cartridge cases being tapered at a Government plant.

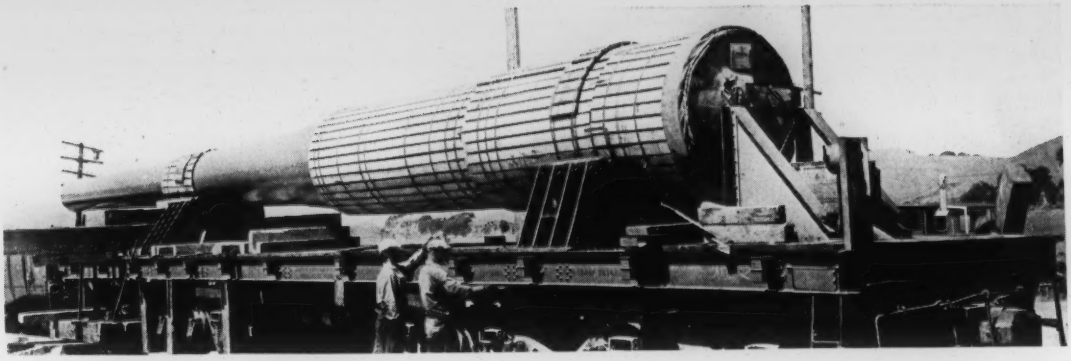
Left — Gaging and weighing cartridges which have brass cases. These cartridges are used in airplane machine guns.

Below—This is the inlet end of an annealing furnace. The rolls of strip Brass ride through the furnace on a conveyor, and when the metal comes out the other end it is annealed and ready to be worked; that is, rolled to thinner gage for making munitions for the armed forces. (O.W.I.)

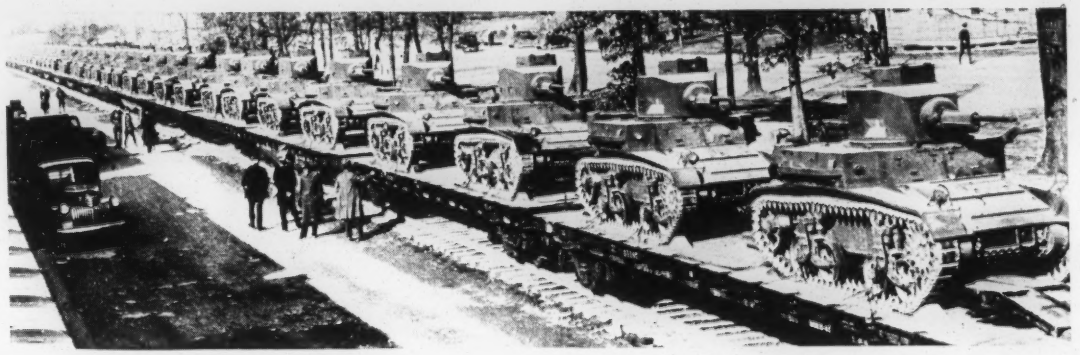


Below—These women are inspecting Brass cartridge cases manufactured by the Armstrong Cork Company for use by the armed forces in the 40mm Bofors rapid-fire anti-aircraft guns. This company has converted from most peace-time products to the manufacture of war munitions.

Right—Giant guns like this are being carried by the railroads to the Atlantic and Pacific.



RAILROADS carrying millions of troops



Above—A trainload of tanks ready for shipment from a Mid-Western city to an eastern port. (Army Signal Corps)

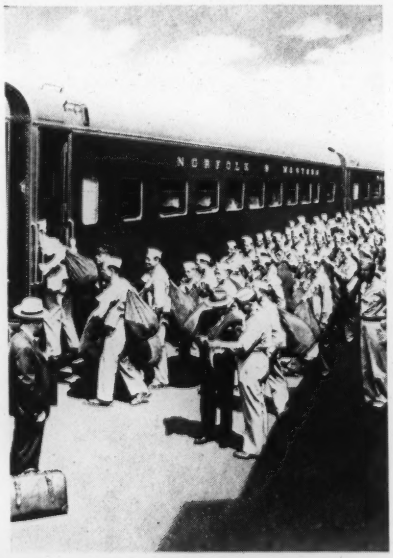
SINCE THE UNITED STATES entered the War American railroads have handled the greatest movement of men and materials in history.

"In all the world no job is being done better today than by the American railroads," declared Chairman Clarence F. Lea, of the House Committee on Interstate and Foreign Commerce recently. Spokesmen for the Army and Navy, Office of Defense Transportation and other war agencies have also said much the same thing in commenting on the outstanding performance by the nation's rail carriers.

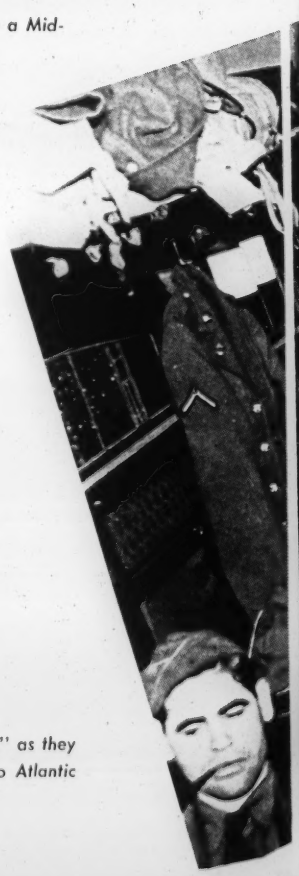
Millions of soldiers are being transported to and from training camps throughout the country and to ports of embarkation on their way to the fighting fronts. With millions of other passengers, including businessmen on war missions, soldiers and sailors on leave, vacationists and others, it all adds up to the greatest volume of passenger traffic the railroads have ever experienced.

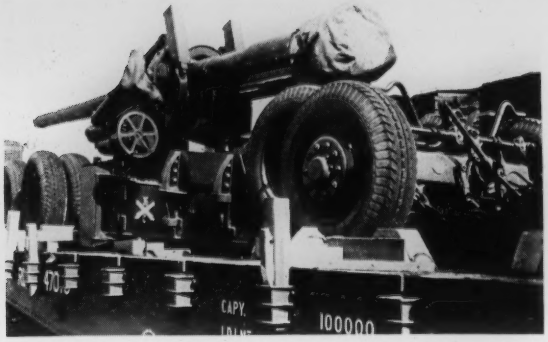
To move the men and the 3,000 vehicles and other impedimenta of an armored division requires about 75 trains of from 28 to 45 cars each, depending upon the length of the freight cars used for the division's equipment.

Millions and millions of pounds of Copper and Brass are necessary metals required by the railroads for equipment and maintenance.



Above—Soldiers of the armed forces ride "first class" as they are transferred to training camps in the States or to Atlantic and Pacific ports. (Norfolk & Western)





Left—Unloading one of the big 155 mm. guns which later saw action in the African campaign. (Signal Corps)

Right—Invasion barges used by the Army are enroute to a western port. Many hundreds are now being built. (Erie Railroad photo)

to and from training camps and to sea ports on both our coasts . .

Women are employed as rivet heaters in the shops of the Southern Pacific Railroad.

Above—Troop trains are given the right of way over everything else as they thunder across the country carrying fully trained soldiers to ports of embarkation on both the Atlantic and Pacific Oceans.

CANADA is

Left—Munition worker examining a handful of flame tracer bullets before packing to be sent overseas. (Photo —Public Information)

Above—With his Bren machine gun set up on an anti-aircraft mount this soldier sweeps the skies. (Photo — Public Information)

CANADIAN WAR ARMAMENT plants are turning out large numbers of fighting planes, tanks, ships and ammunition for its fighting forces and those of other United Nations. These plants have been operating around the clock to keep pace with the demands of Canadian armed forces who are fighting in every theatre of the total war against the Axis. One of the largest American owned Brass fabricating plants has constructed additions at a cost of more than a million and a half dollars to increase its output.

Every pound of Copper mined in the Land of the Maple Leaf is being used for the construction of planes, tanks, ships and for Brass cases for artillery shells and small arms ammunition. With most of its young men in the service these plants are being manned by older men and by young college girls and women. In addition to War Armament, Canada is also sending overseas large quantities of food stuff from its farm lands. As in World War I, Canada is doing more than its part to bring defeat to the Germans and their allies in this war of unconditional surrender.

In the First World War the Canadian Soldiers won their spurs in turning back the Axis hordes in France. The sons of these veterans were in the thick of the African campaign and constituted the main body of troops that made a barge landing on the French coast.

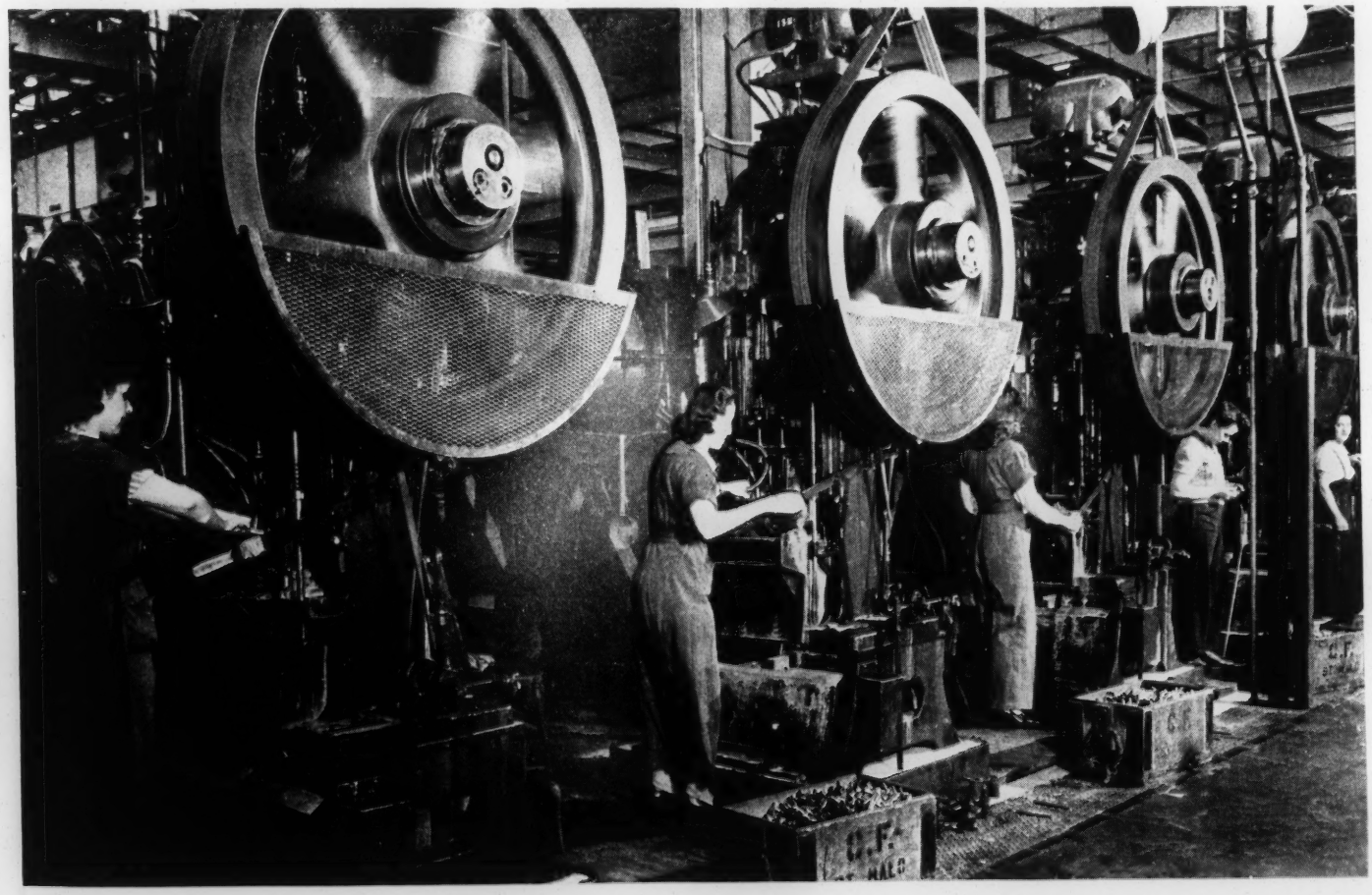
Above—This Canadian girl's work is done inside the cabin of a Bolingbroke bomber being manufactured in the Fairchild plant in Montreal. These bombers were used with telling effect in the raids on Africa and now on Continental Europe against the Axis armies and munition plants. (Public Information)

Above—Women workers in a Canadian munitions plant are shown inspecting completed Brass artillery shell cases. The women of Canada have been working in war plants since the beginning of War II and have taken the place of men who have joined the colors to fight the Axis Powers. (Public Information)

is sending large war supplies to all Fronts . . .

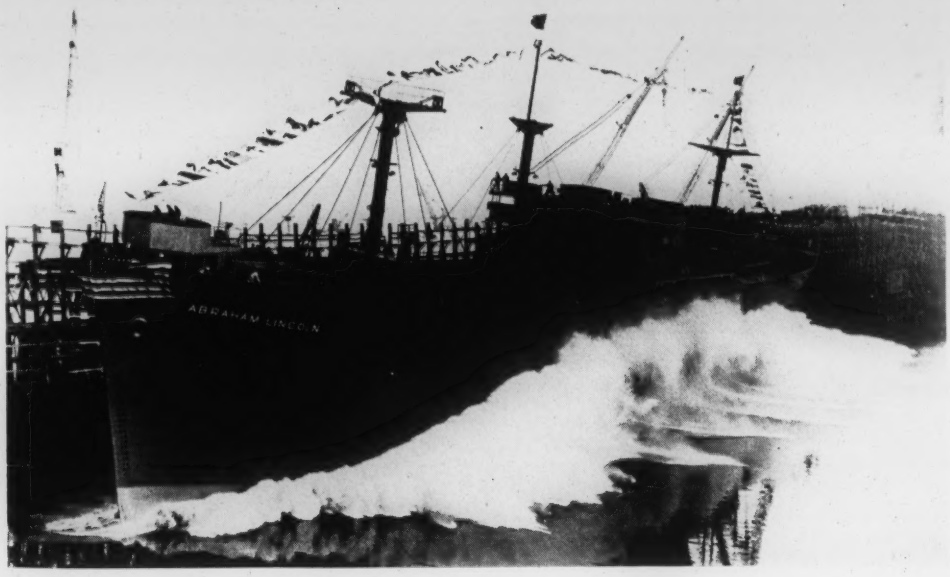
Above—The Valentine, the tank that was shipped to Russia in large quantities is a medium light tank officially rated at 18 tons. It is Diesel motored and the body armour plate riveted and welded. The rotating turret may be operated either by hand or by electric controls. In reality, it is a giant mechanical ferret capable of burrowing its way through a brick building. As large as a living room in an ordinary home, it is able to travel at nearly 20 miles an hour, climb hills and ford small streams. (Public Information)

Above—Machine guns of a fighting plane being reloaded before another take-off.



Above—This array of machines in one of Canada's large munition plants is operated by women. They produce Brass cartridge cases. (War Information Board Photo)

Right — Sidewise launching of the Abraham Lincoln, a Liberty Ship of the EC-2 class. Hundreds of these vessels are now being rapidly completed and fitted for carrying War Armament and food to all United Nations troops overseas. (Maritime Commission)



Below—Chipping and grinding is an important finishing process for these 23,000 pound Bronze propellers which are used on the Liberty cargo ships.

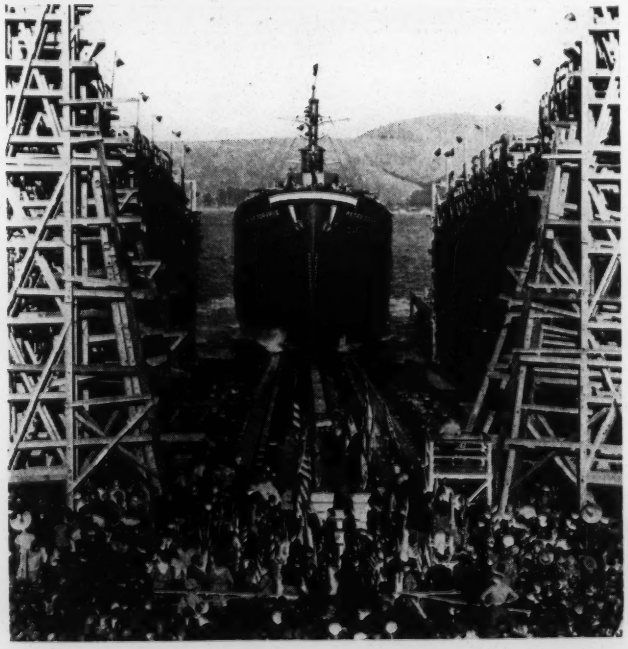
Liberty SHIPS are being built in record time . . . . . .

Below left—The Peter Donahue joins the host of merchant ships which are launched at a rate which greatly exceed that reached during World War I.

Below right — Checking the compass on the bridge of a merchant ship as it ploughs the waves on its way to foreign ports loaded with munitions.

WHEN THE UNITED STATES became involved in this global war, one of its great handicaps was a shortage of shipping facilities. It was then that the Maritime Commission inaugurated a pretentious program and soon Liberty ships were sliding down the ways in shipyards throughout the country. These vessels are carrying tanks, planes, war munitions, containing much Brass, as well as food stuff, not only to our own fighting forces but to those of the other United Nations. Millions of pounds of Copper and its alloys are necessary in the construction of these ships just as these metals are essential in the giant battleships.

Last year the U-Boats took a heavy toll of American and other Allied shipping but this menace, the Navy officials tell us, is being met with new weapons and tactics. A total of 18,000,000 tons of cargo ships will be built this year.

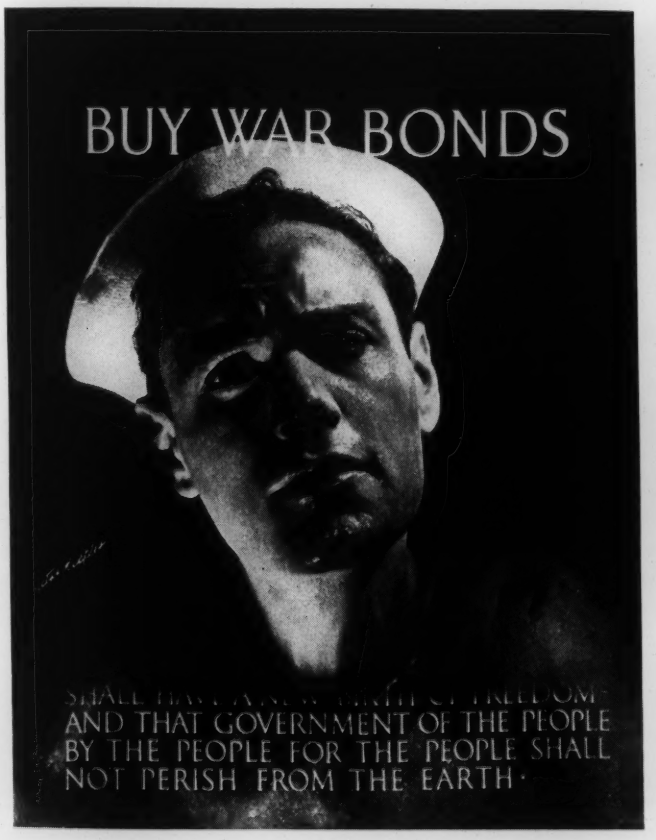


WAR BONDS

are backing up our Fighting Men at the Front

MILLIONS OF DOLLARS are being invested in War Bonds by the member companies of the Copper & Brass Research Association and the men employed in the mills which are operating to capacity to furnish the necessary Copper and Brass materials for War Armament. To date the employes have invested more than $11,000,000 in these Bonds. Both the companies and its employes continue to buy Bonds—the safest investment in the world today.

The second War Bond drive was oversubscribed but this does not mean any of us should stop buying. Billions of dollars more will be needed to build ships, planes, tanks and for munitions before the Axis is forced to make an unconditional surrender. The Treasury Department urges all of us to continue to make sacrifices to buy Bonds. "They Give Their Lives — You Loan Your Money," is the slogan of that department in its continued campaign to sell more and more Bonds to finance our all-out War against the Germans, Italians and the Japanese.



Above—This Army land and water jeep is being given a test on an incrusted pond which it can plough through without trouble.

Right—After a test on land these amphibian cars take to the water just like a duck and are piloted several miles down a stream.

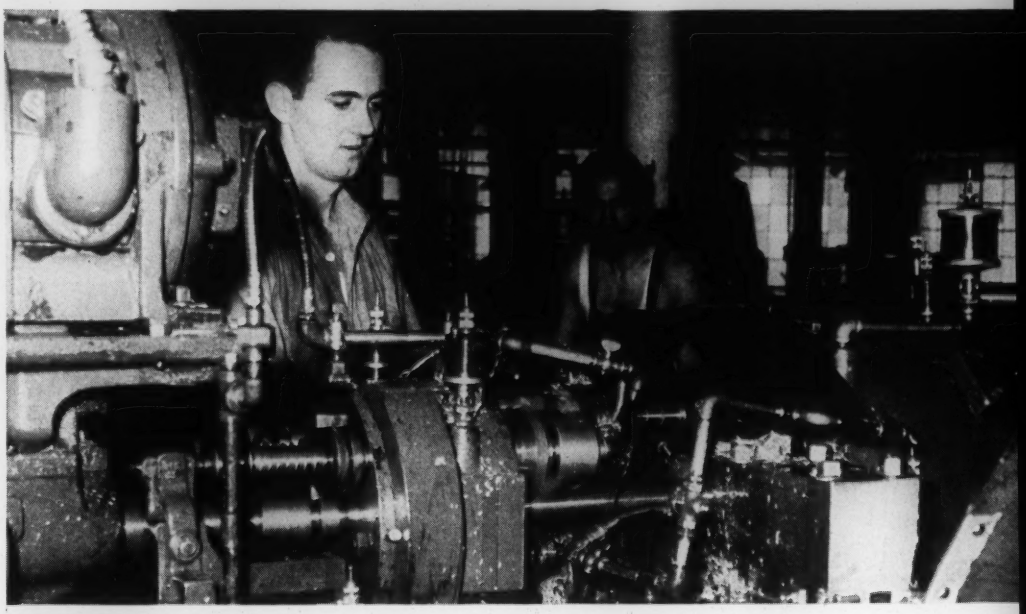
AMPHIBIANS can climb mountains, run on land or in water

Left—These Ford jeeps are on a water merry-go-round cruise near one of the plants which are making them for our army. These land and water cars are now in service in Africa and in the Far East. They can pull up a bank that a man cannot mount and are fast both on land and in water.

WITH VITAL PARTS made from rust-resisting Copper and Brass the new quarter-ton four-wheel drive amphibian car made by the Ford Motor Company is being used by United States forces in all war zones. This vehicle, in effect, is a four-wheel drive truck with a boat built around it. It can ford a river, navigate a lake or perform on land every task ordinarily done by a quarter-ton four wheel drive truck designed for land operations only. Hundreds are being built.

A feature of the craft is that, if necessary, it can pull itself up a river or lake shore bank that would be difficult for a man to climb. This operation is accomplished by means of a power-driven winch in the prow of the craft. The Amphibians were sent to Africa after they had undergone a thorough test by the manufacturer under careful Army supervision. Others were sent to the Far East where they had no trouble climbing mountains and fording streams of the Islands invaded by American troops. When the Japanese first saw them on land they thought they were a new type of jeep but when they saw them swiftly fording streams they learned that again the United States had invented a new war weapon that was effective in its attacking of enemy land forces. Many of these Amphibians have been sent to Russia.

FUSES are made with high speed automatic machines for armed forces



Right—High speed automatic screw machines making Brass fuse heads. Split second timing increases production. The heavy form cutter on the right makes a finished cut. Hundreds of these machines have been converted from peace-time use to war work.

Below—An automatic screw machine making Brass safety pins to be used in detonating fuses. These fuses are being made by millions in this eastern plant which was formerly a large peace-time maker of various machine products.

BRASS FUSES are one of the most important component parts of war ammunition. Such fuses are being made in hundreds of factories throughout the country, many having converted from manufacturing peace-time products. High speed automatic screw machines are used for making the fuse heads. In most of the factories making fuses women are employed to assemble many small parts that go into the making of the completed fuse. These include Brass springs, pins and screws. Brass has proven its superiority for hundreds of peace-time products and is continuing to show its supremacy for the sinews of War.

The Brass fabricating plants of the country are furnishing the material to the plants that are making the fuses which are being used by the millions in training camps and with the armed forces on all battle-fronts. Because Brass is resistant to corrosion it serves best for fuses for many reasons, one of the principal ones being that the fuse does not become useless for firing because its accuracy is destroyed by corrosion. Moreover, Brass is readily worked to the fine finish required for perfection of service.

Extreme left—Assembling the small parts that fit into a Brass fuse which include springs, pins and screws. This worker is tightening a hold down screw which is made of Brass and is accurately machined. Left — Testing a slider plug. The gages are held by special jigs. Women are very deft in performing this type of essential war work.

Left — Inspecting 30 caliber cartridges made from Brass in an eastern arsenal.

Below—This girl is an experienced operator of a large traveling crane in the Watertown arsenal.

ARSENALS

use many tons of Brass

GOVERNMENT ARSENALS are turning out munitions of War ranging from 30 caliber cartridges to cannon. These arsenals are operating at their full capacity and are working three eight-hour shifts to furnish War Armament to our Army, Navy and Air Corps and also to Great Britain, Russia and the Fighting French. Millions of pounds of Copper, Brass and other Copper Alloys are consumed each month.

As is the case in most munition plants and shipyards women are being employed by the Government in its great arsenals. They operate various machinery, inspect Brass cartridge cases and artillery shells and perform other work formerly done by men.

The Watertown arsenal has developed a revolutionary process for the centrifugal casting of cannon barrels, without which officers say the Army would now be sadly deficient in artillery. These big guns fire heavy steel shells containing explosives and having Copper or Copper alloy driving bands. Many of the guns are being shipped to Africa and to the Far East while others are being used in training camps in the States. The arsenals throughout the country are turning them out in tremendously large numbers.

Above—Government employs many women inspectors of the large 75mm artillery shells before they are sent overseas.

Below — Stamping and packing 75mm cartridge cases of the Philadelphia arsenal for shipment to the artillery in all War theatres.

COPPER PENNIES

are a War casualty and are no longer minted . . .

Above—Photo by Alice Cook

COPPER PENNIES, like many peace-time products consuming the red metal so essential to our War effort are no longer being minted. Zinc-coated steel one cent pieces will take their place for the duration. Last year Mrs. Nellie Ross, director of the Federal Mint, states there was enough Copper used to mint pennies to equip 1245 Flying Fortresses. Children are turning in their pennies to buy War Bonds and Stamps. The scene at the right shows the first new zinc-coated pennies being made at the Philadelphia mint. They will soon be in general circulation.

Left—Keys were collected by the millions in most cities throughout the United States during the metal scrap drive.

KEYS collected by the ton in the metal salvage scrap drive . .

WHEN the Civilian Defense Salvage Committee inaugurated its campaign to collect keys to be melted down for the Copper and nickel to be used for War purposes, radio commentators, newspapers, motion picture stars and civic bodies united in the drive with the result that millions and millions were contributed. Within a few days after one radio commentator started his appeal listeners sent him keys by the sack and basket full until his office was packed from floor to ceiling. Many newspapers gave subscriptions for keys.

Out in Hollywood Miss Evelyn Keyes, blond movie star, inaugurated the drive by collecting keys from her fellow stars and studio workers. In Pueblo, Colorado, beautiful Miss Jeanette Ochiotao, devised a novel manner in which to make a collection. Adorned in a key bathing suit she had the city turning keys in by the thousands.

In almost all large cities civic organizations staged all manner of stunts to collect keys. Prizes were given for those turning in the largest number while motion picture owners accepted them as admissions to the theatre. These keys were processed by a Brass fabricating plant and made into war material.

Above—When a well known commentator on a coast-to-coast hookup made an appeal for keys his office received bags full.

Below—Miss Jeanette Ochiotao of Pueblo, Colorado, wore this snappy key bathing suit and keys to the city were given.

Left—Keys are stamped from sheets of nickel silver in four processes as shown in this photo taken at one of the large Brass fabricating plants at Rome, N. Y.

Right—Evelyn Keyes, a Hollywood movie star, answered the plea of the Civilian Defense Salvage Committee by collecting thousands.

The American RED CROSS saves many lives

IF EVERY healthy man and woman in the United States could hear some of the remarkable stories told by officials of the American Red Cross, as well as Army and Navy officers, they would be more than willing to donate a pint of blood for making plasma to be sent to the battle fronts to save the lives of men who have been seriously wounded by the enemy. Men with both legs blown off, others with the loss of one or two hands, have had their lives saved by blood plasma.

The Army and Navy have requested the Red Cross to secure 4,000,000 pints of blood during 1943. This requires only 4,000,000 donors and many times that number should volunteer today as others have done in this humanitarian duty. There are donor stations in all cities and most communities throughout the United States.

Copper and its alloys are used in turning frozen plasma into dried plasma to be shipped to the fighting fronts. Huge Copper vacuum tanks are used to turn the plasma into dry, flaky powder. In each tank are placed several score bottles of frozen plasma obtained from the blood voluntarily donated. The moisture is drawn off and the bottle containing it is then packed in a carton with other necessary supplies and sent to the Army and Navy.

After the cases of plasma and equipment are packed they are transported to the Far East, Africa and to hospitals in England where wounded soldiers are transferred from battlefronts. Many lives have been saved through its use on every front both on land and on the sea.

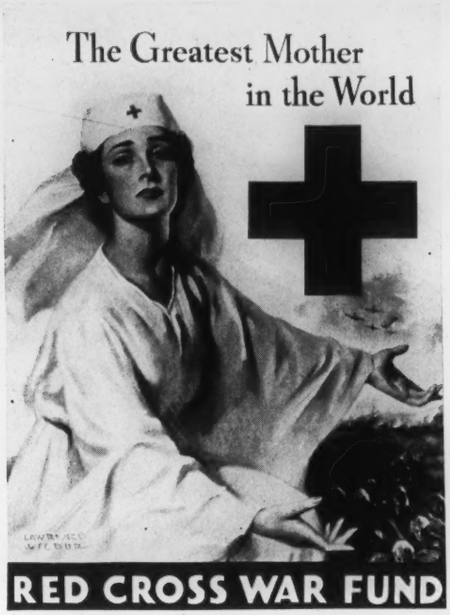
Left — Ann Sheridan, movie star, takes time out from her work to donate a pint of blood to an American Red Cross donor station.

Below—Papuan natives carrying Red Cross blood plasma to the front lines in New Guinea for wounded soldiers and sailors of the United Nations.

Above — Mobile collecting units set up temporary blood donor centers in the outlying rural districts.

Below—Frozen plasma is turned into dry, flaky powder in huge Copper vacuum tanks.

All photos American Red Cross



WAR

finds our civilians are alert

Above—When the greatest disaster in American history struck on Dec. 7, 1941, the Red Cross was ready as it has always been when needed. It has and continues to send thousands of food parcels and other supplies to soldiers of United Nations who are held captives; has and is sending medical supplies to Russia. At the request of the Army and Navy it has charge of collecting blood donated for plasma to be sent to soldiers at the fighting fronts. The Red Cross is continuing its work on the Home Front as well as on the battlefronts throughout the World. It needs your financial help. Your check sent today may save many lives. "When he needs you most Red Cross is at his side."

Above—Day and night men and women spot the skies to give a warning in the event of approaching enemy planes. They have been thoroughly drilled as have the Air Raid Wardens to protect our civilians. Under the direction of the Army the Citizens Defense Corps of which they are a part are drilling constantly to keep in condition.

Left—Soldiers and sailors enjoy recreation centers made possible from coast to coast by the United Service Organization. Many forms of entertainment are provided by canteen hosts and hostesses. Stars of the Screen and Radio appear on these programs at both canteens and camps.

COPPER & BRASS RESEARCH ASSOCIATION
420 Lexington Avenue New York, N. Y.

CABRA Reg. U.S. Pat. Off.

MEMBER COMPANIES

The American Brass Company
Baltimore Brass Company
Bohn Aluminum & Brass Corporation
Bridgeport Brass Company
The Bridgeport Rolling Mills Co.
The Bristol Brass Corporation
Chase Brass & Copper Co., Incorporated
Chicago Extruded Metals Company
Wilbur B. Driver Co.
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C. G. Hussey & Company
Ilsco Copper Tube & Products, Inc.
Lewin-Mathes Company
The Linderme Tube Co.
The Mackenzie Walton Co., Incorporated
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Mueller Brass Co.
National Brass & Copper Company, Inc.
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New England Brass Company
The New Haven Copper Co.
Penn Brass & Copper Company
Phelps Dodge Copper Products Corporation
The Phosphor Bronze Smelting Company
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The Riverside Metal Co.
Scovill Manufacturing Co.
The Seymour Manufacturing Co.
Somers Brass Co., Inc.
Stamford Rolling Mills Co.
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COPPER *and* BRASS *in* TEXTILE INDUSTRIES

COPPER & BRASS
RESEARCH ASSOCIATION
Bulletin
NUMBER 127 DECEMBER, 1943

Mechanic lubricating bearings of drying warps. Cylinders are Copper.

OLDER THAN ANY RECORDED HISTORY is the story of the great textile industry. Its beginning was in the earliest Stone Age when man used hieroglyphics on the rocks of his caves to acquaint archaeologists with his mode of life. During these prehistoric times fabrics, more or less perfect, were being fashioned, ornamented and dyed. Evidences of spinning and weaving are found among the vestiges of prehistoric man in the Far East and Continental Europe.

Some historians tell us that it may have been contemporaneous with the discovery of fire for cooking and the building of shelter. Flax fabrics dating back thousands of years ago have been unearthed in England. Ruins of the Lake Dwellers of the Stone Age in Switzerland have produced them. Beautiful textiles made thousands of years before Christ have been discovered among the early ruins of Peru, Mexico and Egypt and in the caves of New Mexico and Arizona. The Navajo Indians were perhaps the first weavers in North America. They are large sheep raisers.

The textile industry in America began as soon as the first settlers landed. Many of these settlers from England where a knowledge of spinning and weaving existed in every household, brought with them spinning wheels and hand

Negroes at work in the cotton fields of the South, picking the cotton.

Ewing Galloway

COTTON and WOOL

have for centuries been used to make textiles

looms. It soon became one of our first principal industries, although most of the work was done at home. In value of output the textile industry in this country has been second only to food. More people here are directly employed in the growing of cotton, the raising of sheep, the manufacture of articles for which cotton and wool are used than are engaged in any other single industry.

Like most basic industries in this country the textile mills have since Pearl Harbor been operating almost 100 percent in war work for our armed forces and those of the other United Nations. From the cotton fields of the South and the sheep ranches of the West material for making uniforms for our fighting men and women are being shipped by the trainload to the textile mills. These mills are also making materials for planes, parachutes, tents and dozens of other uses.

The great textile mills of this country like most modern industries depend on equipment using Copper and Brass to manufacture their products. It is the purpose of this issue of the Bulletin to illustrate the importance of the textile industry to our war effort and the part the red metal and its alloys play in that effort.

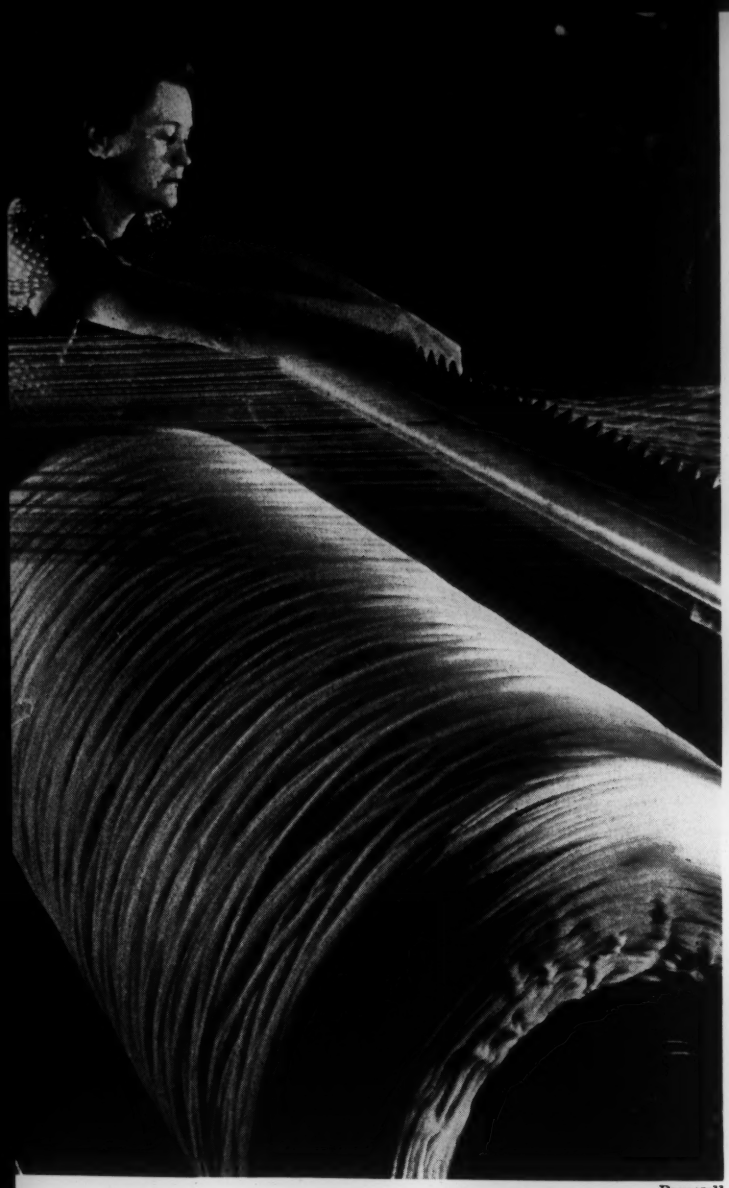
Farm Security Administration

A sheep herder watching his flock on one of the great western ranges.

left, Photo Pepperell Manufacturing Co.

Copper used in

Uniforms and other War



Pepperell

LOOMS OF THE TEXTILE MILLS weave during this global war with ever increasing speed, turning out millions of yards of fabrics of all kinds for our fighting forces and those of our Allies. A trip through any of the five great mills of the Pepperell Manufacturing Company of Boston show just what the textile industry of this country is contributing to the war effort. The sharp whine of the spinning frames as they spin yarn to feed the many thousand looms is sweet music but not to the ears of the Axis Powers in Europe or the Far East.

There are many important operations in a textile mill, to be exact, some 17 in the manufacture of cotton cloth alone. In these operations 21 important uses of Copper, Brass and Bronze are made. Many of these are illustrated on these two pages and on page 7. How many millions of pounds of Copper and its alloys are in use by this industry today cannot be even estimated. But without Copper, Brass and Bronze this great industry like most others would not be in a position to turn out the equipment necessary for the Army, Navy and Air Forces.

Some of the more important uses of Copper and its alloys include: Copper cylinders in dry cans, Copper in cotton slashers, Bronze for pumps and piping on carbonizers, Brass water lines,

Left—Mrs. V. Scott Rogers is manning her husband's warping machine at Lindale, Ga. because he is in the United States Navy. The rolls of warpers are made of Brass.

Reliance Manufacturing Co.

Below—Dr. H. D. Evans adjusts ether extraction apparatus in one test of cloth bleaching process at Biddleford, Maine, laboratory of the Pepperell Manufacturing Co.

Pepperell

Pepperell

Above—Mrs. Leo Martin is sewing sheets which are being used by our armed forces. Her husband is a radioman in the Navy and was formerly an employee of Pepperell.

Union Special Machine Co.

PROCESSING of all Military

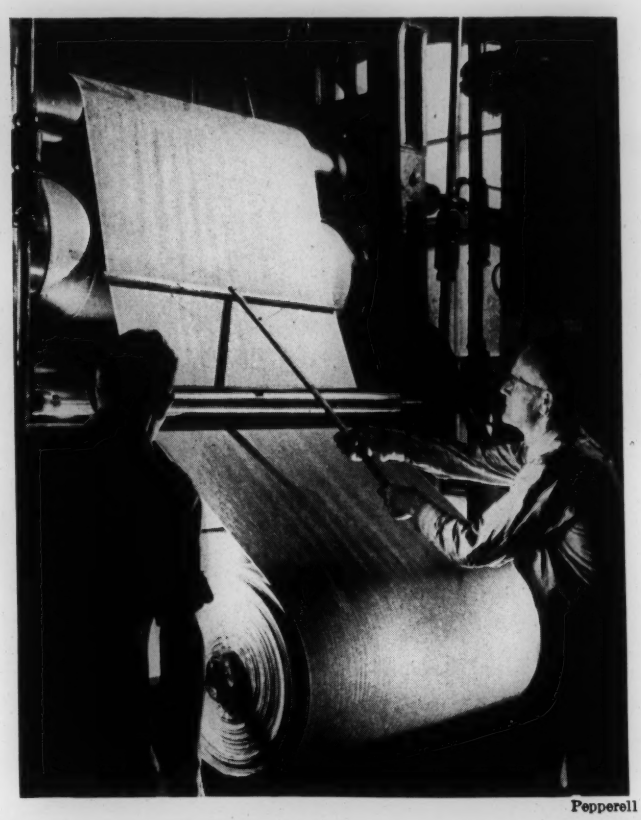
Materials by the Great Textile Industry . . .

Copper and Brass rolls in printing machines, Brass depressing rolls, Brass rolls for yarn in steam dressers, Copper for lining dye and starch tubs, Copper coils for bleachers, Copper lined slasher size boxes, Brass steam pipes in dye tubs, kettles, machine boiling off and size boxes. Brass rakes in wool scouring machines, Brass rolls in singeing machines, Brass rolls in warpers, Bronze for spreader bars, Brass pipe for size circulating machines, Copper dippers and pails.

Because of its long and satisfactory service Copper and Brass installed in the textile mills many years ago is doing its duty in this war work. A great amount of new equipment is used.

Sigmund Eisner Co.

Above—A young lady sewing Brass belt hooks on our armed service blouses at a New Jersey plant.



Pepperell

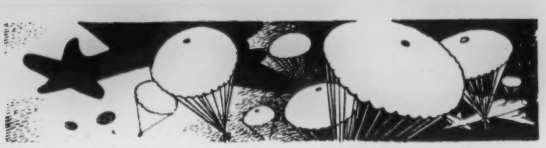
Right—Rolling cloth for parachutes, for sheets and a score of other uses is part of the everyday job of these men at a Pepperell plant. The rolls are of Bronze.

Pepperell

Left—Out in Chicago the Reliance Company is turning out textile materials for our armed forces with modern machinery harnessed with power over Copper wires and in which Brass is also being largely used.

Right—Lavella and Exa Lasseter, a sister team of doffer and spinner on one of the Pepperell frames. Both have husbands in the Army. Brass guides the yarn through for making jungle hammocks for Far East.

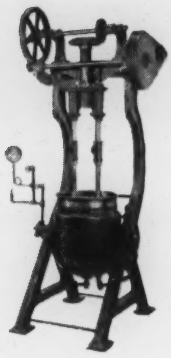
Left—The Annin & Co. of New Jersey is one of the largest manufacturers of American flags in the States. This scene shows an employee sewing one of millions of flags made annually at its large plant.



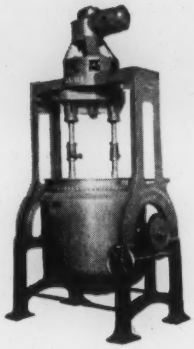
MANUFACTURE

These 'chutes and shrouds are hung in an Air Corps Base to be dried.

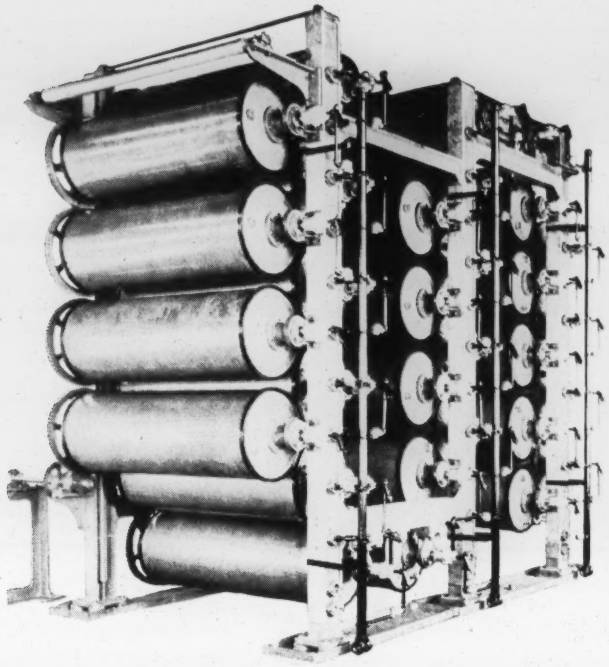
# of Textiles improved with Copper and Brass . .



Left — Thirty-gallon Copper jacketed starch and color mixing kettles equipped with agitators made from Brass at Textile-Finishing Mchnry. Co.



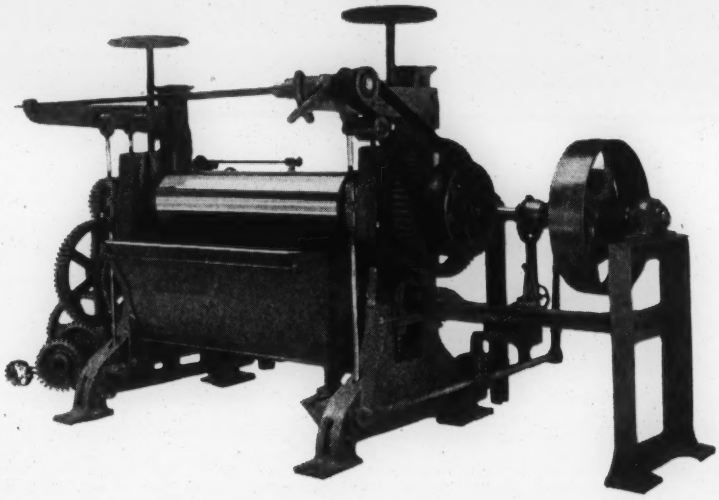
Right—A 250-gallon capacity Copper jacketed starch and color mixing kettle. This is also equipped with agitators made from a Brass alloy.



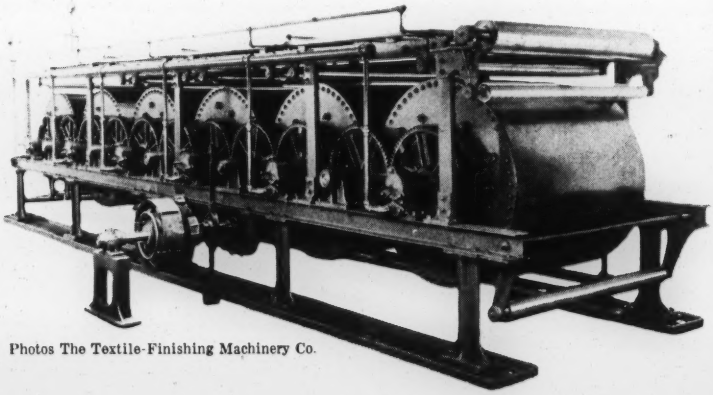
Above—Illustrating a cotton piece goods cylinder drying machine with 23″ diameter Copper cylinders. These are used by The Textile-Finishing Machinery Company.

Below—Bleaching is a most exacting textile art. Copper coils are used as an important part of the equipment. This picture was taken at one of the Pepperell plants.

Pepperell

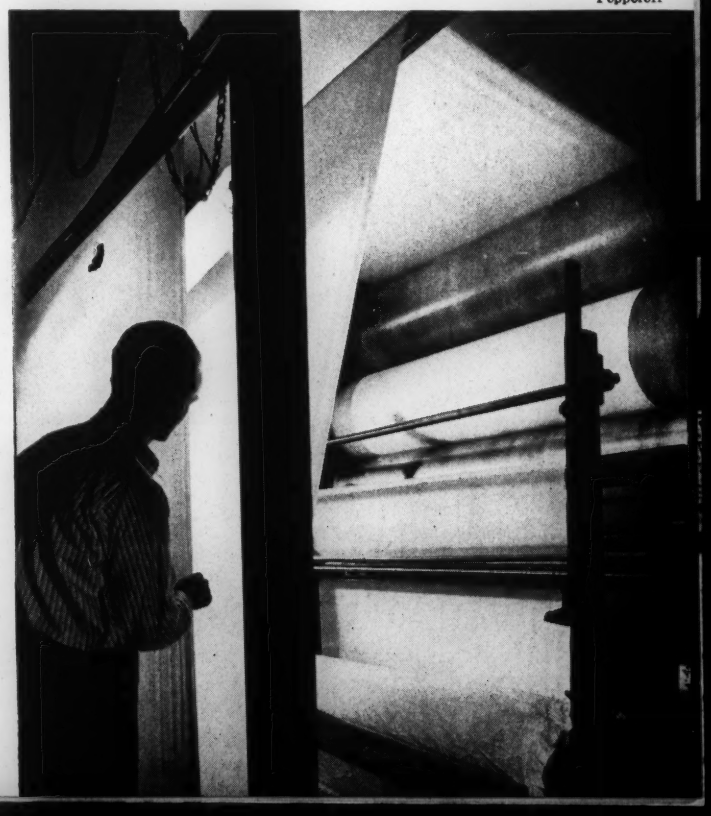


Above—A heavy duty friction starch mangle with top Brass covered roll. The Brass shell is mounted on a cast iron body to form the roll of this modern machine.



Photos The Textile-Finishing Machinery Co.

Above—A cotton print cloth drying machine with six 48″ diameter Copper cylinders and with contact and binder rolls. This is a new type machine in the textile industry.



left, Photo Pepperell Manufacturing Co.

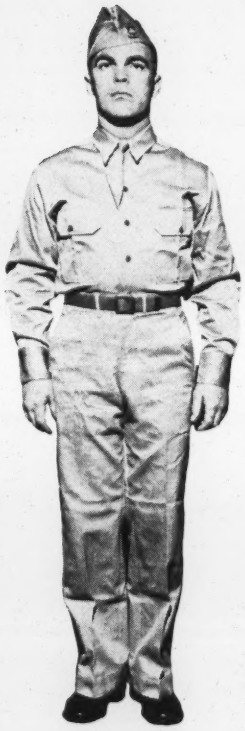
Photos by U. S. Army Signal Corps.

Our ARMY

Left—The Quartermasters Corps has designed a new Ski-troop uniform. Ski trooper, left, has turned his parka white side out, and has donned a pair of white ski trousers for mountain duty.

FROM THE HOT SANDS OF AFRICA to the snow covered slopes of Iceland or in the jungles of the South Pacific our Army is not only better armed but also better clothed than any of the Axis Powers. The Quartermaster Corps has had designed uniforms to withstand the rigors of winter and to keep our men as comfortable as possible while fighting the enemy in the hot and humid climates of the Far Eastern jungles where they are now slowly but surely driving back the treacherous Japanese from the islands and inland territory they conquered.

All uniforms are made of water-repellent cotton fabric and those for winter are lined with wool. Knitted wristlets, collars



Above left—A new summer uniform of cotton twill has been designed for the Army. Garrison cap is trimmed with colored cord-edge braid to show arm or service of soldier, and carries the distinctive insignia of his organization. Above right—A soldier illustrating the carrying of 50 pounds of portable hospital equipment in the Southwest Pacific sector.

Above—Newly designed parachute uniform made of water-repellent cotton. The coat has extra large pleated bellows-type pockets for greater carrying capacity and a special zipper pocket for a knife.

Above—Quartermaster designers have not overlooked any item to provide for the comfort of our Forces in this new uniform for winter combat. The uniforms are of water-proofed cotton.

is equipped with the most modern uniforms to fight on all fronts..

and the bottom of winter jackets assure close fit for warmth. The gloves are of the flying type, as used by the Air Corps. Overshoes protect the feet from dampness.

A new parachute jumper uniform has been designed. The coat is water-repellent cotton with extra large, pleated, bellows type pockets for greater carrying capacity. A pocket at the neck carries a knife and is accessible from either side, through double side slide-fastener arrangement in this uniform.

Winter and summer uniforms for the women in service are not only very attractive but also very serviceable. They are serving on most of the war fronts throughout the world.

COVER OF THIS ISSUE:

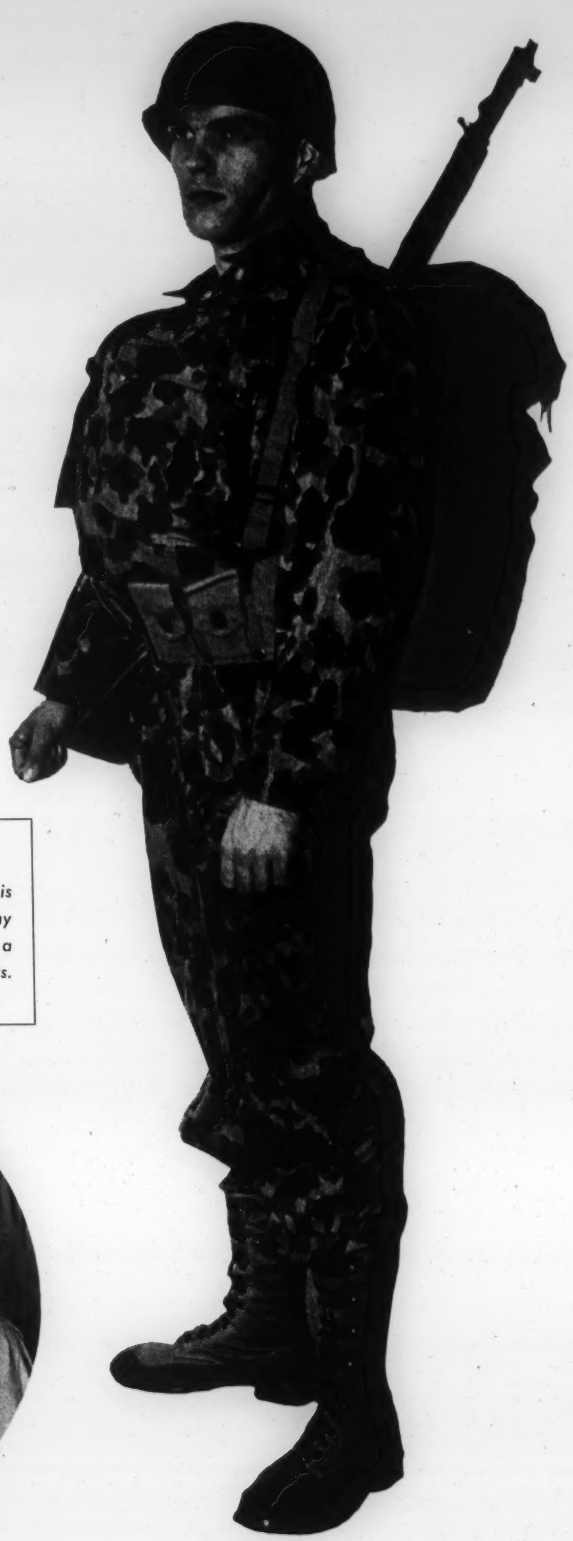
The four-color illustration on the front cover of this issue of the Bulletin was furnished by the U. S. Army Public Relations Department at Washington. It is a soldier decorated with 50-caliber machine-gun bullets. Material for the flag was made on Bronze rolls.

Acme

Above—Second Lieutenant Doris Hyde of Lancaster, Pa., upholds the very best traditions of the Army Nurse Corps. She and her feminine officers and girls in the ranks are doing heroic work.

Acme

Above—Sylvia Mahan of Longmeadow, Mass., bids her WAC sisters to "rise and shine" as she blows her Brass bugle outside a training camp at Daytona Beach, Florida. She enlisted early.



Above—This soldier is wearing a jungle uniform in which our fighting men give the Japs the well known run-around in the South Pacific. These uniforms have inflated bouyancy balloons inside, which are helpful in crossing streams in advancing against the enemy and are camouflaged for jungle fighting. These uniforms are made on print cloth presses in the textile mills.

Our U. S. NAVY uniforms are much s

WITH OUR NAVY FAST BECOMING the largest in the world the uniforms of both the officers and men are far superior to those worn in World War I. Winter and summer, in all kinds of weather, the men of the sea are on constant patrol or engaging the enemy whenever he dares to lurk from his protected ports of shelter.

The summer uniforms are light and comfortable while those worn during the winter months when the mercury is often below the zero mark are warm and afford every protection to the men while on deck manning their guns or while doing landing duty.

The officers and enlisted girls in the WAVES and in the Nurse Corps also have attractive and comfortable uniforms, both for summer and winter wear. Many of these are serving not only on the home front but also overseas. Like the Army uniforms those of the Navy are of cotton or wool. They, too, are processed by the textile industry of the country with equipment in which Copper, Brass and Bronze play a most important part. These uniforms are being worn wherever the men of our fighting fleets are serving.

Above—The Navy's new slate gray uniform worn by Captain C. D. Kirk, will replace the present khaki. The coat is of the same design as the khaki, except that the patch pockets have been made smaller.

Right—A serviceman in light marching gear wearing new white uniform.

h superior to those of our other Wars

Left—Seaman Second Class in his new blue uniform.

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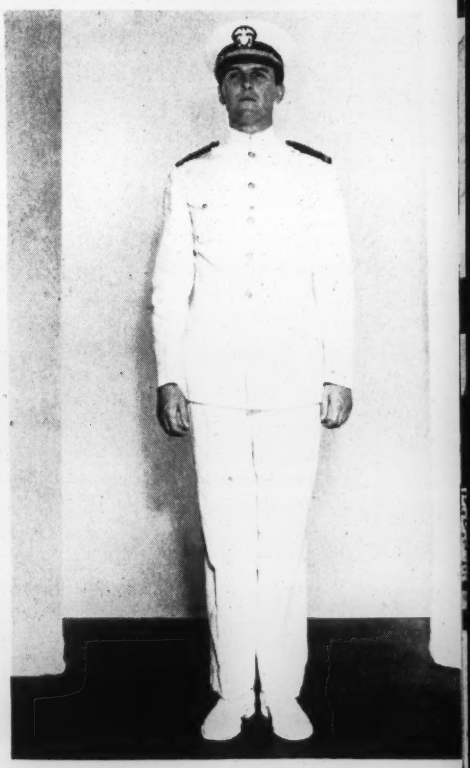
Above—Uniforms of a Navy Nurse and a WAVE are natty.

Right—An Ensign in his winter overcoat and his new hat.

Left—A seaman in dress blue and in overcoat and cap.

Above—Coast Guard and Navy Ensigns in summer wear.



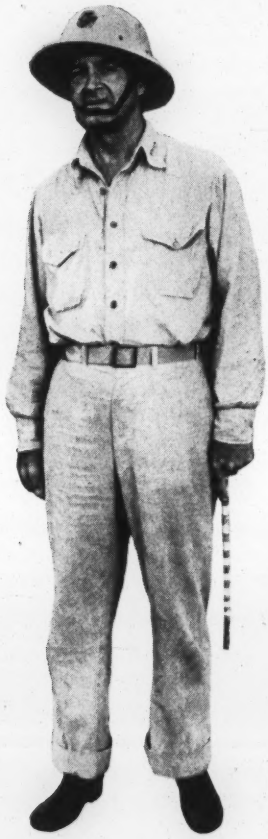
Right—An Ensign attired in his new white uniform.

Official U. S. Navy Photos

The picturesque uniforms of the

THE UNIFORMS OF THE UNITED STATES Marines are known throughout the world but they are perhaps best known by the Japs and will long be remembered by the fighting men and civilians of the Land of the Rising Sun. The heroic deeds of the Marines in the South Pacific need no eulogy. Their history will live long after those of this generation will have answered taps. The Marines have always lived up to their motto—"Ever Faithful". They are fighting on all battlefronts.

The gear one of these Leathernecks carries is perhaps best illustrated by the photograph on page 13. It was taken during the fighting on Guadalcanal and the Nips have marveled not only at these fighting men on land and sea but also the uniforms they wear. These are made of the best water-proof cotton and wool materials obtainable, both for duty in the frozen North and for the jungles of the South Pacific.



Above—Lieutenant General Alexander A. Vandergrift, USMC. Commander in his tropical uniform in the Solomons. Above left—A Marine Corporal in his combat gear and with complete service pack.

Above—Master Gunnery Sergeant James J. Haggerty standing at attention in his new Marine uniform. Haggerty won the Silver Star Medal for his heroic deeds against the Japs in the Far East.

fighting U. S. MARINES

The cunning Japanese elected to camouflage their snipers in uniforms that would blend in with the tropical forests where the fighting was most fierce but they soon found the Marines had even better uniforms run off print dress rolls of Bronze that they could not distinguish from the jungle fastnesses.

Something new has been added to the Marine Corps during this war—the Marine Corps Women's Reserve. Both enlisted women and commissioned officers receive indoctrination training at Camp LeJeune, New River, North Carolina. Under a new system officer candidates are selected from the enlisted ranks. Then they take an extensive training of seven weeks, similar in part to that by the men in the Corps. The strenuous course also includes drill, discipline, organization study and classroom instruction to prepare them for one of the 35 different types of duty they will take over on completion of their studies.

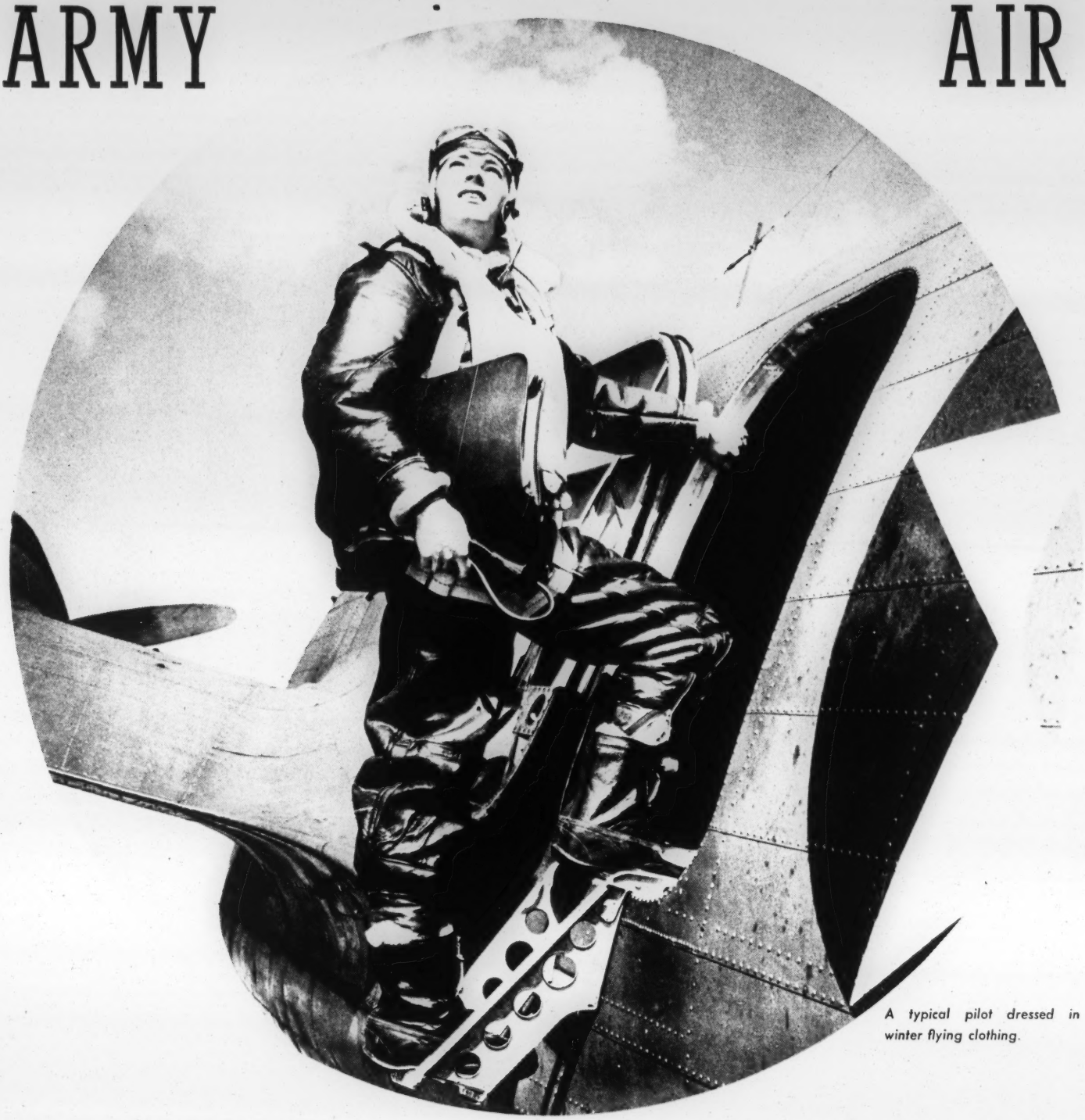
Above—A group of young college graduates studying to become officers in the Marine Corps Women's Reserve. The uniforms of the girls in the Marine Corps are as natty as those of the men behind the guns at the front. Their training camp is now at Camp LeJeune, North Carolina.

Official U. S. Marine Corps Photos

Above—A Marine struggles with his gear as he lands at Guadalcanal. He saw much action in the South Pacific and wrote to his mother over here "Mom, it sure has been hard fighting but I made it."

Right—Lieutenant Paul Moore of the Marine Corps is shown receiving the Navy Cross from Lieut. Col. Iven C. Stickney for gallantry in leading his men in the South Pacific although badly wounded.

ARMY AIR



A typical pilot dressed in winter flying clothing.

THOSE "FLYING DEVILS," as they are known to the enemy, the United States Army Air Forces, have emblazoned on the pages of history an everlasting American saga. With the British they battered down the best pilots and planes the Italians and Germans had to offer in Africa and Italy. They continue to shoot out of the sky the best the Germans and her satellites in Europe have to offer. The Japanese are also no longer anxious to challenge our Air Forces. They realize that our airmen are equipped with better fighting planes of all types, better weapons and with far better wearing apparel for both high and low altitudes.

On these two pages are shown some of the new types of uniforms worn by our fighters of the skies. These are made of cotton, wool and leather in the textile mills of this country. The WASPS, which is the woman's auxiliary ferrying squadron have matching gray-green gabardine uniforms.

FORCES best dressed and equipped of any in the World . .

Official Photos U. S. Air Forces

Left — Sergt. Seymour Matz, Selfridge Field, caught by the camera as he is landing from an airship clad neatly in the smart and comfortable summer uniform of the enlisted personnel.

Below center — Captain Mily H. Campbell who for 14 years was one of the T.W.A. pilots, is shown wearing the insignia and uniform of an officer of the Air Transport Command of the Army Air Forces.

Below right—Mrs. Nancy Love, Director Ferrying Division, WASPS, makes a pretty picture attired in her new uniform, standing beside a training plane. It is a regulation matching gray-green gabardine jacket and slacks.

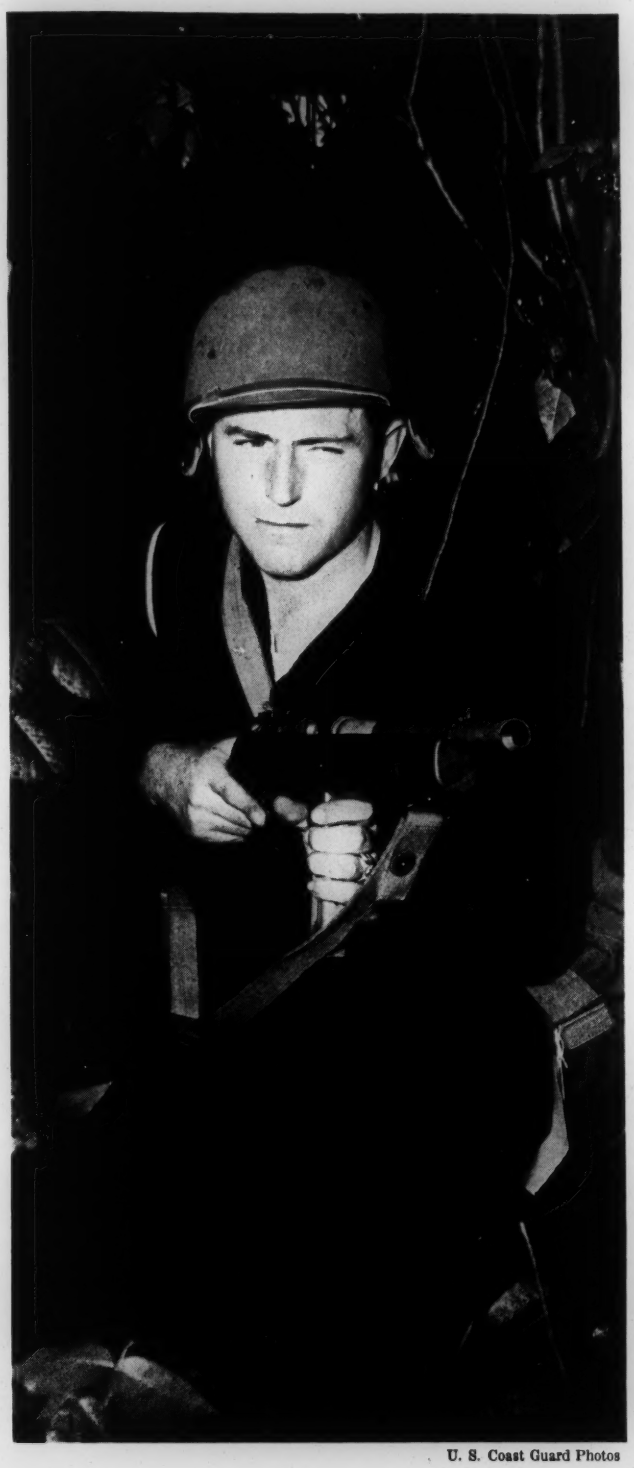
Acme

Above—A Sergeant standing comfortably clothed in dress blouse, belt and serge pants. This is a new type of uniform for our flying men and the cloth is spun from cotton and wool by our textile industries.

Right—Wearing full winter flying gear these Randolph Field aviation cadets are ready to fly thousands of feet above the clouds in their intensive training for combat duty on all fronts.

True to its tradition 'Always

attired in new uniforms are making history . . . .



U. S. Coast Guard Photos

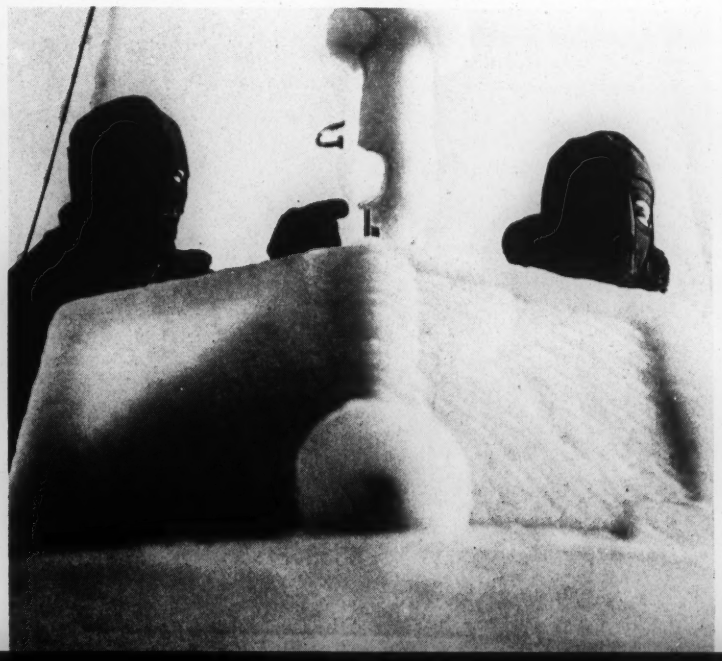
THE UNITED STATES COAST GUARD not only guards our coastlines from enemy attack during this global war but also convoys merchant ships to neutral countries, runs down Axis wolf packs and assists in landing our fighting forces in enemy territory. In the Atlantic, the West Indies, the Mediterranean, the South Pacific, in fact on all the Seven Seas the Coast Guard has and continues to establish a place in our national history that it will always be justly proud.

Coast Guard ships and planes of every type are on constant patrol engaging the enemy on every fighting front. The record of Coast Guard cutters that have destroyed the best of Hitler's and Tojo's submarines has from time to time been heralded in the daily press and needs no repetition here. Its glory of discovering the German saboteurs who were either executed or given long terms of imprisonment is well known to every school boy and girl who will when they grow to manhood and womanhood recall their deeds blazened on the escutcheon of American history throughout the world in this global war.

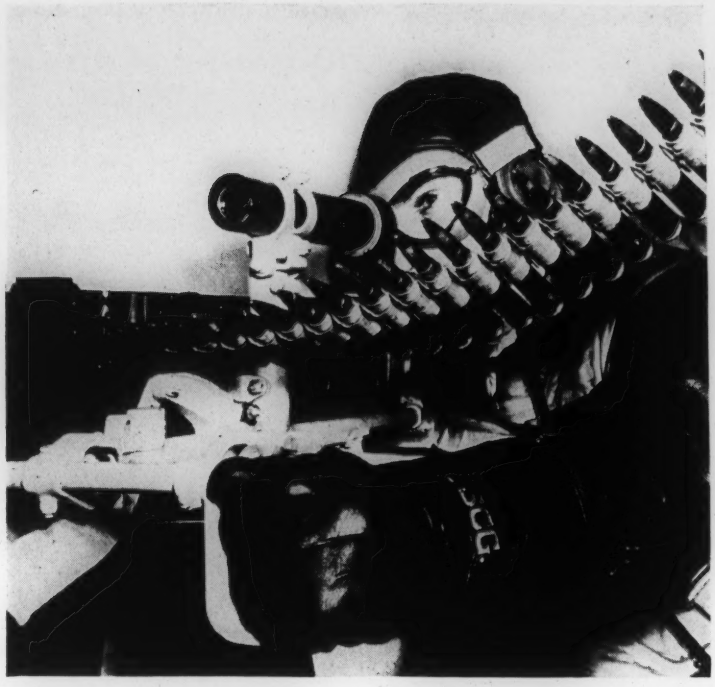
The officers and enlisted men of the Coast Guard as well as the pretty SPARS are provided with the best winter and summer uniforms our Government and the textile mills can furnish. They are designed for comfort, convenience and lasting wear.

Left—The tough-looking customer pictured with his gun ready for action is a Coast Guardsman, who is taking combat training at an Eastern Base for active duty.

Below—Dressed for wild winter weather on the North Atlantic officers on a Sub-chaser look like figures not of this world, but they are always ready for action.



Ready' the COAST GUARD



Above—A Coast Guard machine gunner on one of the Coast Guard planes. Little known branch of the service the Coast Guard Aviation guards our shipping lanes, patrols our beaches and shoreline.

Right—Two Coast Guardsmen are shown signaling at a Coast Guard Base. This is an important part of Coast Guard training, both at sea and ashore. They wear a silver shield on the right arm.

Below—Coast Guardsman Dom Vilardi, a fireman first class made over forty landings in Africa after being wounded.

Above—Smiling Frieda Woods of Fairmont, West Virginia, is a typical SPAR of the U. S. Coast Guard Women's Reserve for replacing men.

MERCHANT MARINE

Unsung heroes

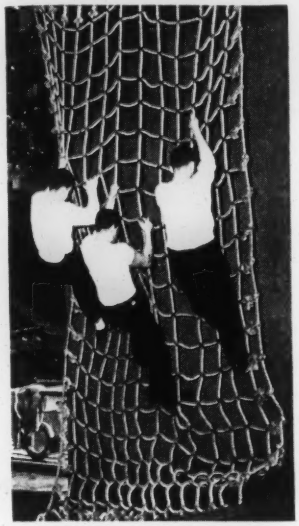
Above—Off to the training ship for these future Merchant Marine men who are training at the Service Station at Hoffman Island, New York.

manning the ships for our Troops and Allies

THE MEN OF THE MERCHANT MARINE are perhaps the unsung heroes of World War II. Most of them are young men who have enlisted and many of them have been on ships that have been torpedoed by the Axis Powers. Some of these boys have been shipwrecked on many occasions and spent long hours either swimming or in lifeboats until rescued. A number of them have been on tankers that have been hit and set on fire. They have had to swim for their very lives beyond the flaming waters until picked up by rescue boats. Uncle Sam is taking good care of these fighting men of the sea. At Great Neck, N. Y., there is a large training school where cadets participate in intensive training for the rigors of the many arduous duties in all climates at sea.

When the cadets and the enlisted men are ready for duty on the ocean, they also, are furnished with the best possible equipment. They are given the same warm uniforms for winter and the same cool ones for summer that the Navy men are given. And these too are made possible by Copper and its Alloys in the processing of cloth into uniforms.

Above—Cadets of the merchant marine are trained in New York.



Above—Cadets at Great Neck in Naval College at intensive training.

U. S. Navy Official Photos

Left—Instruction for signaling.

Above—Trainees at military drill.

Above—Four officers of the Women's Branches of Our Armed Forces—Left to right a WAC, WAVE, Navy Nurse and Army Nurse. Several hundred thousands young girls and women are now in Active Service.

Below—Help the Tuberculosis Drive by buying your Christmas Seals Early.

WOMEN of the Nation are giving their Full Support to Our Fighting Men

Above—The American Women's Volunteer Service has and continues to do yeoman work during the War. This is Jeanette McDonald, one of the officers shown in her uniform.

Above—Mary Dougherty, a Red Cross Canteen worker inspects a Red Cross food package going to an American prisoner of War. Packages like these are sent regularly to our prisoners of War.

Above—The United States Service Organizations furnishes all forms of entertainment for our Fighting Men when on leave and also at many of the theatres of war throughout the world in this Global War.

Kodachrome photograph, U. S. Marine Corps.

Corp. Florence Jelsma of Paterson, N. J., now serving with the Marine Corps at Camp Lejeune, New River, N. C.

Living up to the true tradition of the Marine Corps, Ever Faithful, many college graduates are in this branch of our Armed Forces.

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PRINTED IN THE U. S. A.

the IRON WORKER

Thomas Jefferson's "Other Home"

SUMMER—1943

THE IRON WORKER

Published by and for the employees of The Lynchburg Foundry Company and relating to its personnel and products
E. A. Watson, Editor
Plants at Lynchburg, and Radford, Virginia. Main Office: Lynchburg, Virginia; Branch Offices: 50 Broad Street, New York, N. Y.; 122 South Michigan Avenue, Chicago, Illinois

Vol. 6 LYNCHBURG, VIRGINIA No. 3

THE COVER—Not so famous nationally as Albemarle County's "Monticello" but as sainted a shrine locally, "Poplar Forest," Thomas Jefferson's Bedford County estate, just outside of Lynchburg, stands today much as when he came there for rest and recuperation throughout his long ownership. In the Hutter family since it passed from the Jefferson heirs, it has not been marred by too much modernization and repair, but kept by appreciative care in almost its original state. The view on the cover and other photographs in this issue were made for THE IRON WORKER exactly two hundred years after Thomas Jefferson's birth.

As We Go to Press . . .

"IN RECOGNITION OF OUTSTANDING PRODUCTION ACHIEVEMENT"

On June 1, 1943, came this telegram to the "Lynchburg Foundry Company. Mr. Henry E. McWane, Pres., Lynchburg, Virginia":

"As Chairman of the United States Maritime Commission Board of Awards, I take pleasure in advising you that the Board, in recognition of outstanding production achievement, has awarded your Company the Maritime 'M' pennant, the Victory Fleet flag, and Maritime merit badges for all your employees. A United States Maritime Commission representative will personally present the award. . . . "

—H. L. Vickery, Commissioner U. S. Maritime Commission, War Shipping Administration.

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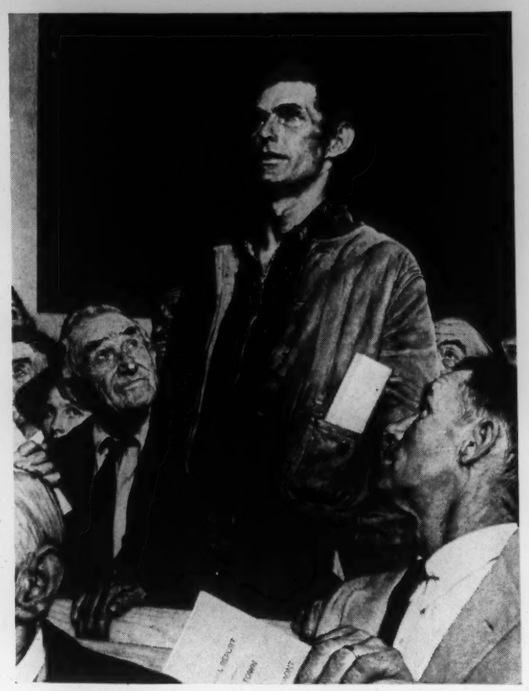
The Four Freedoms

"I am grateful for the reproduction of Norman Rockwell's paintings illustrating the Four Freedoms. He has done a superb job in bringing home the plain, everyday truths behind them.

"This is the first pictorial representation I have seen of the staunchly American values contained in the rights of free speech and free worship and our goals of freedom from fear and want."

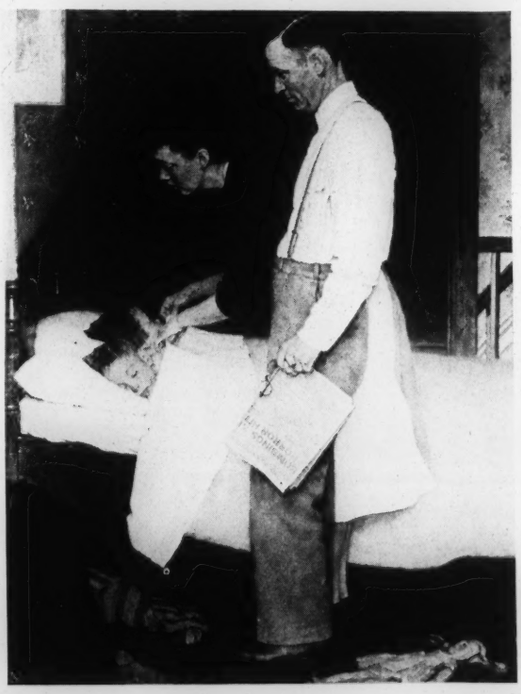
—President Franklin D. Roosevelt.



Freedom of Speech

Freedom of Worship

Freedom from Want



Freedom from Fear

Reproduced by permission
THE SATURDAY EVENING POST

Apostle of Freedom

"The Signing of the Declaration of Independence," from the celebrated painting by John Trumbull

THOMAS JEFFERSON

(April 13, 1743-July 4, 1826)

"We hold these truths to be self-evident: That all men are created equal; that they are endowed by their Creator with certain inalienable rights; that among these are life, liberty, and the pursuit of happiness."

IN this year 1943 which has brought the observance of his bicentenniel, Thomas Jefferson, "Father of Democracy," is more alive in human thought than at any time since his birth. More alive because never before were the rights of man, as defined by his pen and personality, so precious or so imperiled.

Faith in the Democracy he designed, has become a beacon light to nations darkened by tyranny. *"Life, liberty, and the pursuit of happiness"* has been lifted bodily from the framework of the *Declaration of Independence* to become a world creed.

The basic freedoms championed by Jefferson are now the "four freedoms" on which the peace after this war is being planned. That formula for the future has as its component parts the principles he laid down for American liberty. By them the United States became great and by them the United States will remain great.

Thomas Jefferson's mind knew no confines. He thought in broad human terms and he gave the world a philosophy that will make him immortal. The world is therefore beginning to claim him for its own. But Virginia, place of his birth, has special claim, and in Virginia his memory has kept fresh always in the institutions he created, and the culture he nurtured.

Lynchburg too has special claim on Thomas Jefferson. Here he visited many times, often informally with close friends and also on occasions when he helped the townfolk pay honor to visiting celebrities. To "Poplar Forest," his Bedford County estate on its outskirts, he came at intervals covering a half century, for relaxation from the pressure of his many arduous affairs. To Lynchburg he paid high tribute in his writings, praising it for its "correct course," and terming it "the most enterprising spot in the state."

In his frequent trips from "Monticello" to this "other home," Jefferson crossed the James River just above the site of the Lynchburg Foundry Company shops. Before Lynch's Ferry gave the place its name, he referred to it as "Winston's," from the site of the house of his friend Judge Edmund Winston on the bluff below the plant. In these hills his great soul found repose.

It was as a genial neighbor and friend, rather than as President or statesman, that Lynchburg knew and loved "Mr. Jefferson" when he was in residence at "Poplar Forest." That his advice and counsel was an important influence in the town's development is substantiated by old letters and journals of the day. His invention of an improved plow is known to have given impetus to local manufacturing of agricultural implements. His remarkable knowledge of mechanical principles was a practical guide to those founding fathers who directed Lynchburg's infant steps into its industrial paths.

A young lady of old Lynchburg recorded in her diary, just recently come to light, that her awe of Thomas Jefferson was dispelled "by seeing him eat, drink, laugh, and talk like ordinary mortals, partaking heartily of apple pie and sweet milk." Accompanying her parents to a home where he was a guest, she was astonished to find him a kindly human being. She had expected to see him "as he had been represented in pictures and statuary, with a roll of parchment in his hand." Marks of his touch are priceless treasures in Piedmont Virginia.

"Freedom was the text of his life . . . Freedom was the burden of his labors." To the last of his crowded eighty-three years he pleaded the cause of equal opportunity for all mankind. Fifty years to the day from the signing of the Declaration, that "birth certificate of a nation," he passed to life immortal.

The inscription on the granite marker over his grave he directed to be put there as his epitaph. The simple words disregard completely "his presidential and diplomatic achievements, his democratic struggles with the Federalist group headed by Hamilton, his purchase of Louisiana, and his accomplishments in music, architecture, science, law, medicine, engineering, astronomy, horticulture, mathematics, and literature." Epitaph enough for him was this:

Here was buried
Thomas Jefferson
Author of the Declaration of Independence
Of the Statute of Virginia for Religious Freedom
And Father of the University of Virginia

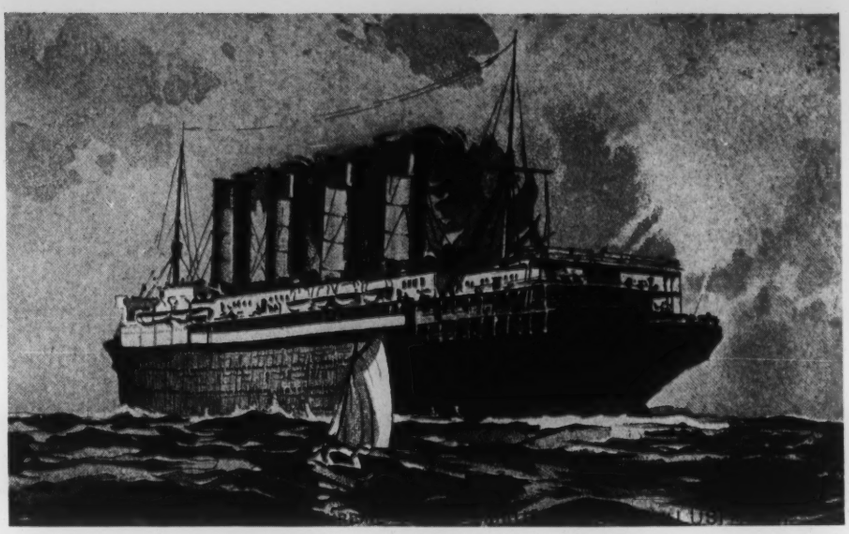
A magnificent Washington shrine in the classic beauty of his taste has this 1943 been dedicated as his national memorial. It is fitting tribute. But no man-made temple can ever hold the meaning of that simple hallowed spot in his beloved Albemarle, made majestic by his greatness.

the cores. The machine works all right but the layout can be improved greatly.

"We left Newcastle at 2:35 p. m. for Middleborough."

(Here follows a brief account of a visit to the *"Pipe Works of Cochrane Co. Limited"* where *"Mr. Douglas Cochrane treated us very cordially and had us take lunch with him."* The *"observations at this plant, written out in detail separately"* have not been found.)

After resting at the Adelphi Hotel in Liverpool for several days the travelers left over the Midland Railway for Sheepbridge where they were shown through the works there. Then on to Chesterfield and from there by cab to Barrow Hill where they went through the Stanley Works. *"Mr. Gandy the Foundry Manager"* at *"one time connected with McNeal and Addyston in the U. S.,"* and still owning his house in Cincinnati, entertained them in his home for dinner with his interesting family, and drove them back to Chesterfield, four miles away, *"in his motor car."*



The Submarine's Most Famous Victim

H. E. McWane, and his brother, J. R. McWane, traveled on the famous new Cunard liner "Lusitania" when they went to England in 1909, and returned on its sister ship the "Mauretania."

The sinking of the "Lusitania" by a German U-boat in World War I, and the resulting loss of hundreds of United States citizens, is credited with having precipitated American entry into the conflict. Its size and palatial appointments were a source of wonder to H. E. McWane who noted many details of its features:

"The ship is 785 ft. long, 88 ft. wide and 60 ft. high above the water line; has 22 boilers of 72,000 h. p., four turbine engines, burns 40 tons of coal per hour, carries 180 lbs. steam pressure, and has a carrying capacity of 500 First Cabin; 500 Second Cabin; 1,600 Third Cabin or Steerage, and a crew of 800. The Lounging Room and Smoking Room are massively furnished in natural walnut quartered, and the Writing Room is a beauty with pink furniture and carpet. The Lounging Room and the Smoking Room and Library as well as the Lobby on Deck A have immense fireplaces with grate fires and marble mantles with marble columns on each side, 12" in diameter and 12' high. The lounges and chairs are luxurious and inviting. The Dining Saloon is a beautiful place, the fare superb and the service fine. By permission of the Captain we were shown the engines and boilers and other machinery. The main propeller shafts are 30" diameter, and the outer ones 20" diameter."

At Chesterfield they entrained for Nottingham where next day they *"hired a motor car"* to take them to the Stanton Iron Works, eight miles out.

"We passed the estate of Lord Riddleton, the second wealthiest landowner in England. He has a park of 750 acres enclosed by a brick wall 8' high, 7 miles around, requiring 7 years to build and a man served his 7 years apprenticeship on this one job.

"Mr. Chambers, the Foundry Manager, showed us through the works and treated us very courteously. This is the largest pipe works in Great Britain and probably the largest in the world, making 400 tons daily.

"We returned to Nottingham by motor car and took the train for Birmingham."

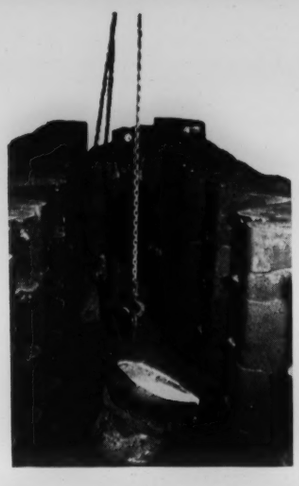
From Birmingham, after a short stay, they went to Stourbridge.

"Went through the works of Jones and Attwood in Stourbridge and saw their core-making machine at work. It does a nice job and makes cores very rapidly. They do beautiful foundry work, making a specialty of light castings and thin light pipe for low pressure use. Their moulding sand is of very fine quality and they dig it right out of the bank alongside the foundry. Mr. Jones says he would be willing to let us make these machines on a royalty of 10%. Met his Foundry Manager, Edward Wright, who seems to be a very bright fellow and is only paid $2.50 a day. Says he is turning out castings at a cost of $10.00 per ton. Says he has gotten up a new way of making tees cheaply."

Later—London—Metropole Hotel—Seeing the sights of London. *"Visited first the Houses of Parliament, then crossed Westminster Bridge over the Thames and returning went through Westminster Abbey."* On other days to Buckingham Palace, London Tower, the Tower Bridge, London Bridge, Guild Hall, Bank of England, Old Bailey and the Mint, St. Paul's, etc.

He went, he saw, and he liked, England and its foundrymen. Today you cannot go to see these plants, or England either, unless you go on business of war. But you like its foundrymen of today for what you know they are doing. You hand it to them for the way they can take it, and the way they deliver the goods. And when you think of them, and the blitz, you square your shoulders and ram that mould a little harder.

"There'll always be an England." And there'll always be faithful foundrymen steadfastly doing their stuff in spite of Hell and Hitler.



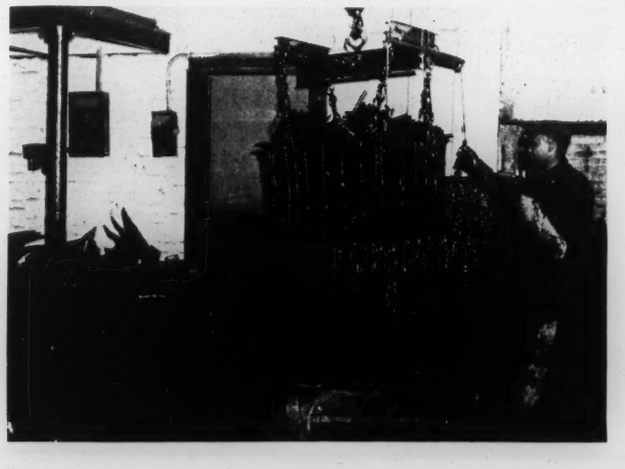
The Lynchburg Foundry Company's original product, the Lynchburg Plow, also goes to war. Current activity on the food front is being reflected in our sector of the service-of-supply.

MEN BEHIND THE PLOW

Present and coming battles for food give the plow high place as a weapon of war. In our shops the men behind the plow—the Lynchburg Plow—are in the front line of war production with fellow workmen filling Army, Navy, and Marine orders.

(All photographs made at the Lynchburg Plant.)

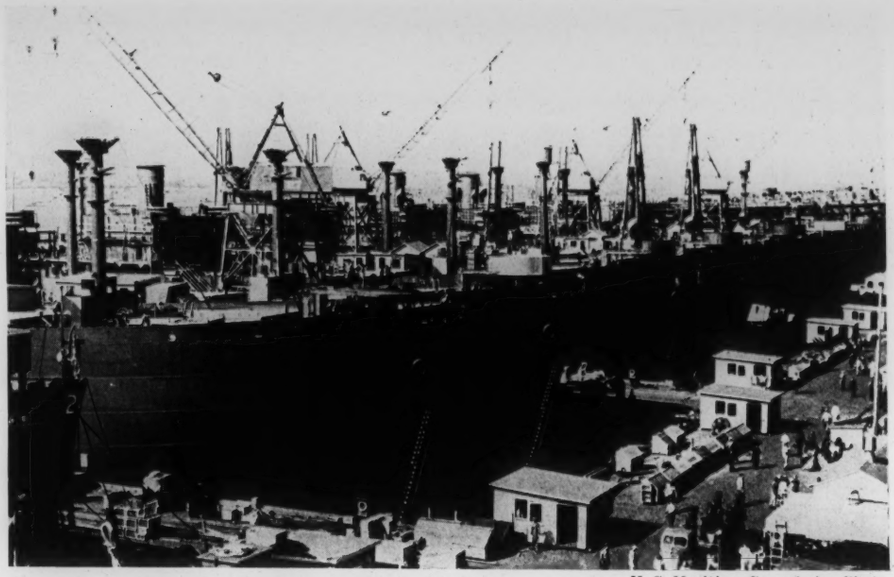
Grinding



Dipping

Shipping

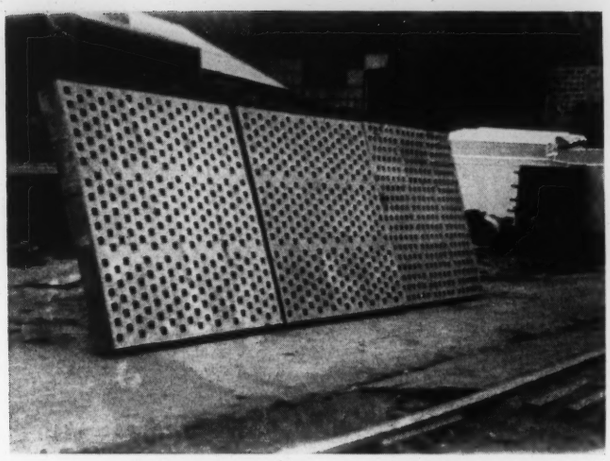
Through the Lynchburg Foundry Company plants in the past two years have gone numbers of bending slabs new to local industries but used extensively in shipyards and metal-working shops where large sections of metal must be bent to certain forms. These photographs illustrate their importance in shipbuilding and in the reconditioning of Allied sea warriors, battered by storm and combat, in port for repairs before returning to battle.



U. S. Maritime Commission Photo

SHIP SHAPE

Ships Being Outfitted at a West Coast Shipyard



Bending Slab Cast at Lynchburg Plant, Ready for Shipment

U. S. Maritime Commission Photo

Bending Floor in Plant at Todd-Bath. Men are Bending Ribs for Propeller Shaftway

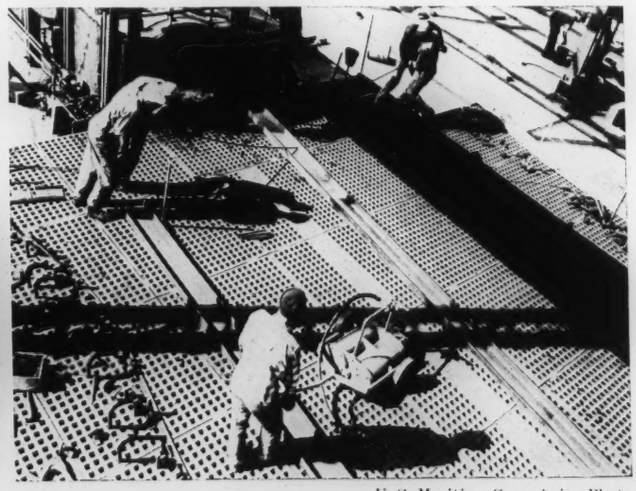
The installation of bending slabs is usually done by making a large floor or table out of them, holding them in place by concrete, steel, or some arrangement that will hold them in a fixed or rigid position.

The metal to be bent is first heated to a white heat by means of a furnace or torch. It is then fastened at one end to the bending slab by wedges, clamps, or dogs. The free end of the piece of metal is then worked into the desired pattern by gradually moving it across the face of the slab by hammers, or wedges, or especially designed bulldozers.

After the metal has been worked into the desired contour it is then clamped into position until it is cool, as it will then hold its form when the clamps are removed.

U. S. Maritime Commission Photo

Straightening a Bent Frame from a Damaged Ship on the Bending Slab. Frame is Brought to White Heat in the Furnace, then Set in Place Against Iron Dogs which are Pegged According to Pattern Into the Slots



U. S. Maritime Commission Photo

Bending Slabs in Action

Salute To Our Foundrywomen!

By T. M. Bost, Jr., *Training Supervisor*

Coremakers at Lynchburg Plant

THE foundry industry has taken another step in the march of time. The day is past when a woman entering the shops is preceded by a man to see if the coast is clear. An inner sanctum for masculine muscle no longer exists. It has been invaded by the "weaker sex." The feminine touch has pushed aside its sacred portals and learned the mysteries of its rituals. Into the ancient and honored order of ironworkers has come the foundrywoman.

When the manpower shortage began to develop, the Lynchburg Foundry Company started giving serious thought to the subject of the woman worker. After much discussion as to where women would fit into our picture, it was decided to try one in the plow foundry core room.

Our First Foundrywoman—Mrs. Olivia Kidd

Then came the problem of selecting the first candidate to venture into this retreat for brawn. She must be well chosen, for her trials and tribulations would naturally be harder than those of any who might follow.

On January 13, 1943, Mrs. Olivia Kidd, clad in bandana, coveralls and safety shoes, marched past rows of goggling eyes, bulging biceps and ladles of red hot iron, to arrive at the core room via a freight elevator. There she was shown her work-place: a bench piled high with oil treated sand, an arrangement of boxes that would fall apart if not held correctly, and an assortment of rammers that appeared to be anything from stilletos to potato mashers.

Mrs. Kidd was shown the purpose of those boxes. It was demonstrated how by clamping the sides, then pack-

Radford's First Women Coremakers
Left to right: Mrs. C. S. Quesenberry, Mrs. Pauline Moore, Mrs. George Linkous

In Radford's Special Foundry
Miss Edith Spencer, Miss Virginia Gallaway, and Mrs. Aileen Howell

New Scenes in the Lynchburg Shops

ing the sand with the rammers, the box could be rolled over, the clamps loosened, the collapsible frame removed from the sand, and a core of the desired shape left remaining. She watched all these details, calmly took her seat, and proceeded to make cores.

When the special foundry heard about the new coremaker in the plow foundry, the cry went out for two girls on trial in its core room. A few days after these went to work, their bosses were asking the personnel department for more like them. Then the plow foundry wanted others too, and again the special foundry called for more.

While all this was happening at Lynchburg, the Radford plant, not to be out-maneuvered, was going through much the same experimentation with equal success. Women workers there were soon making cores so large that it is necessary to handle them with a crane. They go at it as naturally as veterans with long experience. They too, came, they saw, they conquered.

For some time both the Lynchburg and Radford plants have had girls as clerks in the plant offices and as technicians in the sand, physical, and chemical laboratories. They have made good in all these places. Finally, to complete the circuit, comes the woman crane operator. The foundrywoman, after all the talk, has really arrived. And how!

Ladies, take a bow. You are doing an expert double-barreled job of helping whip the Axis. You are doing it not only through your workmanship, but by your smiles, your gay conversation, and your good nature. You have raised the morale of the men to a new high.

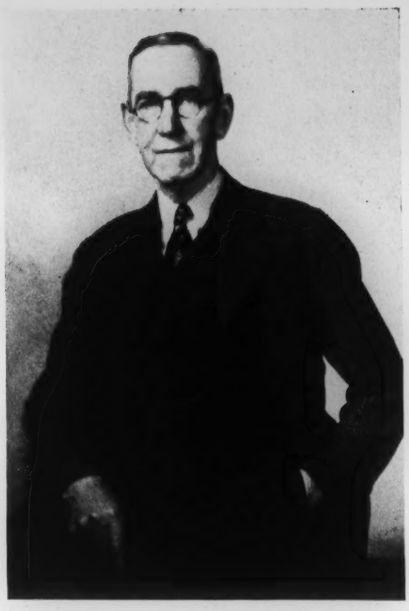
Foundrywomen, foundrymen salute you!

Foundrywomen at the Lynchburg Plant

Front row, left to right: Katherine Gibson, Dorothy Justis, May Downey, Bessie Childress, Louise Kurfman, Dean Gwaltney, Mildred Hutchison, Lillian Crabtree, Erna Wood, Celeste Courtney

Back row: Jane Blankinship, Veva Wood, Virginia George, Elizabeth De Young, Mary Daniel, Olivia Kidd, Gwendolyn Bryant, Gladys Tolley, Ola Cox, Jessie Ray, Frances Riley, Vassie Simpson

Engineering Forbears



Edgar C. Wiley

No one today knows the Lynchburg Foundry Company's antecedents better than E. C. Wiley whose acquaintance began back in its parent plant at Wytheville, Virginia. There as a barefoot boy he first beheld the wonders of machinery and, by inventions thus inspired, attracted the interest of its owner and manager Charles P. McWane (1832-1924). Some years later, after the firm's junior partner, H. E. McWane (1859-1914), had gone from his father's foundry to take over the management of the Glamorgan Works in Lynchburg, events brought Mr. Wiley to the same city and soon the two had begun their long association in the related fields of manufacturing and designing. Together they worked out problems of equipment and improvements in processes, and together they took the buffeting of many a business storm. When Mr. McWane organized our Company as known today, Mr. Wiley drew up plans for its shops and was the consultant on installations. A term on its Board of Directors followed his engineering services. THE IRONWORKER hopes to present his interesting foundry reminiscences when present wartime demands on his time and talents permit their recording. Meanwhile large government projects being constructed under direction of his engineering firm must have priority.

FROM the inception of the first industry there has been an engineering department to plan a project, lay it out, figure the cost and supervise the work. Although it may not be apparent as such, an engineering unit operates in almost every individual undertaking carried through to completion. Take for instance the "Victory Garden." No doubt you first planned yours in your mind, decided upon its size, what you would plant, and where you would put it. Perhaps you even made a sketch of it. In the same way engineering projects are carried out in industry.

A small company may not have an engineering department in name, but just the same someone is doing that work. As the company enlarges and tasks along engineering lines increase, it becomes necessary to bring this work under the head of one authority and an engineering department comes into being. In this way our own company developed its special division to this end, after some years when individuals often classified otherwise rendered these services.

Looking back on engineering personnel of other years brings up names bright on many pages of Company history. Those were building years and these men were builders. Evidence there is aplenty that they builded well.

First and foremost is E. C. Wiley, now senior member of the firm of Wiley and Wilson, consulting engineers of Lynchburg. Prior to the Company's ownership of the Radford Plant, when the late Henry E. McWane, Sr., was operating it under lease, Mr. Wiley redesigned the cranes in the pit cast shop from steam to hydraulic operation. These cranes are still being operated in accordance with his design.

In 1903 when Mr. McWane decided to build a pipe shop at the Lynchburg Plant, he retained Mr. Wiley to design and make all necessary drawings for the shop. With the assistance of George T. Carter (known to us all as Captain Carter) who was of great help because of his practical foundry experience, this shop was planned and put into successful operation. Mr. Wiley drew up its entire layout of building, cranes, pits, core ovens, flasks, core strikes and other appurtenances.

Later Mr. Wiley designed and made detail drawings for a pipe shop with revolving pits planned for erection at Norfolk, Virginia. This plant, however, failed to materialize. He also worked on the design of the Anniston, Alabama, plant which the Company built in 1912 and later sold, known now as the Alabama Pipe Company.

George T. Carter

Sixty years ago George T. Carter came to Lynchburg from his native Prince Edward County and found employment with the millwright who eventually got the job of converting the original Glamorgan Works into a pipe foundry under direction of the late H. E. McWane, Sr. So impressed was Mr. McWane with young Carter's work that he offered him a place in that foundry organization of 1888. When Mr. McWane in 1902 resigned from Glamorgan to become president of this Company, Mr. Carter came with him to build the pipe shop of which he in time became superintendent. Under the administration of the founder and through the tenure of one son, Lawrence H. McWane, his successor, and into that of another son his namesake, Henry E. McWane, George T. Carter has sustained the faith imposed in him more than a half century ago. Until his retirement he kept actively abreast of foundry progress and practised the highest traditions of industrial relationships. Today, at the age of eighty-six, dean of the Company's pension roll, he is as loyal and as beloved as when he supervised its pipe-making.

Arthur Roberts, Jr., was born in Radford, Virginia, on September 3, 1902, the son of Lucy Kuhn Roberts and Arthur Roberts.

He was educated at the Radford Public Schools and at Virginia Polytechnic Institute, being graduated from the latter school in 1924 with a B. S. degree in Mechanical Engineering. He took post-graduate work at V. P. I. and received an M. E. degree in Mechanical Engineering in 1925.

While in college he was active in athletics, military and social life, winning letters in football, basketball and track, and serving as Battalion Commander and Captain of the best-drilled Company. He still carries a watch given to him by his Company, which is engraved with the names of every man on its roll. He was Defending Attorney of the Corps of Cadets, a member of the Y. M. C. A. Council and Athletic Editor of the school paper during his senior year.

Arthur Roberts, Jr.

On leaving Virginia Tech he worked a short time with the Chesapeake and Potomac Telephone Company in Washington, D. C.; the Standard Oil Company of New Jersey in New York and Bayway, New Jersey, and W. L. Branch, Inc., Mortgage Brokers, Huntington, West Virginia.

He came to work for the Lynchburg Foundry Company in 1927, being first employed in Radford. Since that time he has done estimating at both the Radford and the Lynchburg plants, was appointed consecutively foreman of the Radford Machine Shop, Master Mechanic at the Radford Plant, Assistant Works Manager at the Lynchburg Plant, supervised the Bedaux Department when it was first started, was transferred to the Engineering Department as estimator and draftsman and has been Chief Engineer since March 1936.

He was married in December 1934 to Elise Martin Jones of Radford and has two children, Nora Jane (five), and Arthur, III, "Buddy," (three). His parents are still living, his father being the retired Agent and Yardmaster of the Norfolk and Western Railway Company at Radford, Virginia. He has two sisters, Mrs. E. E. Jessee and Mrs. J. W. Caldwell, both of Radford.

His hobbies are his family and home. He spends most of his spare time working in his yard or making something for the house. He is fond of athletics and follows all sports in the newspapers. During the football season he can usually be seen as a spectator at a game or officiating at a Glass High School or V. E. S. contest.

He is a member of the American Society of Mechanical Engineers and serves on the Executive Committee of its Virginia Section. He is also a member of the American Foundrymen's Association.

Mr. Wiley did other engineering jobs for the Company down the years, having been closely associated with Mr. McWane, Sr., from apprenticeship days, in intimate friendship and business relationships. His present staff did the engineering on our power house in Radford, which was rebuilt in 1931, and also on the plow storage building at Lynchburg. Until his own business made withdrawal necessary, he served as a member of the Company's Board of Directors. Although no longer connected in official capacity he still maintains his interest and assistance which is highly valued.

A. P. Montague, before becoming Works Superintendent of the Lynchburg Plant, had been associated with Mr. Wiley in redesigning and rebuilding the cranes at the Radford pit cast pipe shop. During his years with the Company Mr. Montague always kept his drawing board in his office and attended to the engineering work along with his managerial duties.

Numerous others carried through engineering assignments in those days of simpler corporate structure than now. Master mechanics, machine shop foremen, electricians and departmental foremen directed activities of this classification. W. G. Hammerstrom, in 1916, became the Company's first Chief Engineer and directed the Engineering Department through the expansion period of the First World War and its aftermath. M. G. Sowder, who had been connected with the department since 1923, succeeded him as Chief Engineer when his retirement was necessitated by ill health. Both, now deceased, are remembered too well by present personnel for a recounting of their accomplishments to have place here.

In recent years the Engineering Department has seen many changes due to conditions of the times. Of those formerly on its staff who have either left the Company or have been transferred to other departments are: T. M. Bost, Jr., Hugh K. McGavok, B. T. Morgan, R. W. Mays, T. R. Rucker, S. L. Kelly, Ralph M. Ballagh and Amon Showalter. Three have gone into the armed services: First Lieutenant Arthur P. Figg, who is serving with the Air Corps at Seymour Johnson Field Air Base, Goldsboro, North Carolina; Corporal Harrison McGill, U. S. Marine Corps, whose stories of his experiences on Guadacanal under General Vandegrift as carried in our local papers are still fresh in our minds; and Second Class Yoeman St. Elmo Hawkins, serving with the Seabees, stationed at present at Camp Peary, Williamsburg, Virginia.

Present personnel is at its minimum but carries on efficiently as a vital unit in the Company's war production organization. Estimating, maintenance, construction, and general service to all departments come within its scope.

—Arthur Roberts, Jr.

The Engineering Department

By Arthur Roberts, Jr., *Chief Engineer*

THE work of the Engineering Department is interesting, educational and diversified. It may be compared to a drive for the first time along a winding mountain road. You drive with anticipation of what you are going to see around the next curve. It may turn out to be a beautiful valley scene, a cut through solid rock, or a dangerous bend with a thousand-foot drop on one side. It may be a stretch blocked or made hazarodus by a cave-in or fallen rocks. It may be a clear straight road with flowers alongside that give you a sudden happy feeling of peace and contentment.

We of the Engineering Department, in the day's work, as on the mountain drive, often encounter sudden twists and turns that develop unexpected situations. The night before, or in the morning as we dress or ride to work, we make mental outlines of what we want to do during the day. On reaching the office we may find a telegram for an immediate quotation, or a call from a customer in distress. A broken crane or vital operating machine in one of our own shops may need emergency attention or some essential repair part. Plans are put aside until the urgent business of the moment is completed. Then, again, there may be no interruptions and plans for the day can be put through smoothly.

Production estimating is one of the principal functions of the Engineering Department. Inquiries received by the Sales Department with drawings showing special items, must have a bill of material made up, with estimated cost and weight of each item. Upon receiving these inquiries we first go over the drawings and take off all items we can manufacture. Then we refer to our files for such costs on these as are available from actual records. Where figures cannot be supplied from the files, shop costs must be assembled.

Plans for War Production
Arthur Roberts, Jr. (at desk), and T. Gibson Hobbs, Jr., just before he entered the Navy as Ensign

From the shops, data is secured on our own sheets for the information sought. The pattern shop figures the time required to make the pattern, the amount of material needed, and the type of pattern and core box. The special foundry gives us the molding and core costs, time and material for making the flask, if any, and the kind of molding figured. At Lynchburg this would be machine or floor molding. At Radford it would be dry sand, green sand, loam or pit molding.

The machine shop furnishes the time for the machining, and, when required, the cost also of testing or protection of flanges for export. All these estimates are handled through the Standards Department which, where possible, gives the individual departmental shop cost. In addition, each department notes the time it would take to complete the job, and from this information a shipping promise is figured.

While the shop departments are figuring on the job, we are sending out inquiries on any material which we do not manufacture but will have to furnish if the order is received. If there are two sets of prints we are also figuring the weights of the individual items so that when all shop and outside information is received we will be ready to arrive at our estimated cost.

After all this has been assembled, we write up the inquiry on an estimate sheet and for each item show a description, at which shop the item will be made, weight, pattern time, foundry time, machining time, testing time, flask time and cost of purchased equipment. All labor is shown on our estimates in hours so that regardless of how the labor rates may fluctuate our records can always be used.

Weight and hours of manufacture must be converted to dollars and cents. This is done by multiplying the tonnage figure or weight of the item by a figure that consists of the cost of iron, melting or conversion, cleaning, shipping, power, taxes, fire insurance, depreciation and all other expenses which our Cost Department prorates on a tonnage basis. Then the time shown by each department with work to do on the item, is multiplied by a figure that consists of direct labor (cost per hour), indirect labor and material, group insurance, foremen's salaries, social security and any other costs prorated against the individual department. A total figure placed finally opposite each item is its cost of manufacture.

Notes thought advisable are made on the estimate. These may concern standard material which the customer might use instead of specials. They may cover information desired if the order is received. A shipping promise for the entire bill of material may be given. The estimate is then turned back to the Sales Department for quoting.

Radford Smith, Jr., Estimator, and Miss Margaret Bell, Clerk in the Engineering Department

If this quotation develops into an order than the entire file is returned to the Engineering Department for checking before it is entered. We have to check the order against the estimate to determine if any changes have been made, check over the blueprints, issue information to the Purchasing Department so that they may order materials to be purchased, make any changes necessary to conform to the customer's desires, advise what additional information, if any, is needed, and turn the file over to the Order Department.

After such a build-up of interest it is easy to understand the thrill of following this work through the shop, and mentally if not actually to its ultimate destination. You watch the pattern develop, the mold made, the metal poured, the finished casting loaded for shipment. Someday you may even see the installation itself. It may be in a filter plant helping in the purification of drinking water, or in a power house carrying steam to generate electricity. It may be in a chemical plant making high explosives, rubber or some other product of chemistry's miracles. It may be deep in the mechanism of a ship on a vital war mission. Whichever its use you feel pride in having had a part in its creation.

The other duties of the Department are handled in a more or less set pattern. On shop estimating and construction, we work with the shop management. If some new addition is desired we draw up its plans, work up an estimated cost for the project and present it to the Company management for consideration. If it is approved, we then have to let the work to a contractor or have it done within our own organization. In either case we are responsible for seeing that it is built according to our plans and that the cost is held, as far as possible, within our estimated figures. The construction, repair, and maintenance work at the shops is usually handled through the shop Master Mechanic so when on a plant tour either Bob Simpson or Earl Viar is the right guide to direct us.

Because the Engineering Department is a service department, it reaches into every other department of the Company by the same process that every other department reaches into this department. It is an interlocking relationship that makes us dependent on others for any accomplishment of our own. Whatever we may achieve we owe in large part to the fine spirit of cooperation within the Company organization.

Special Foundryman

James W. Crist is a special foundryman in a larger sense than is implied just by his long service presiding over the Lynchburg Special Foundry. He is a special foundryman because he is a veteran of the old school yet has kept continuously abreast of the new. Rare and special indeed is such ability to put aside cherished old lessons for the study and mastery of entirely different approaches to the same subject.

The Company was the Lynchburg Plow Works when Mr. Crist first joined its forces in 1901. J. R. McWane, its president at that date, hired him to build a storeroom for the plow shop. He stayed on as a carpenter and millwright and afterwards gravitated naturally to the wood pattern shop where he was for a number of years assistant foreman. It was during this period that he worked out improvements in our molding-machine and green-sand-core practices that focused attention on his progressive ideas. In 1928 came his appointment as superintendent of the Special Foundry. Later he was used for a time at Radford working in an advisory capacity on foundry problems there.

James W. Crist exemplifies the sturdy stock of which he was born in Campbell County, Virginia, on May 15, 1874. His parents, Read and Martha Canada Crist, reared to adult years a family of seventeen children of whom James was the youngest. One of his older brothers had been killed in the Civil War before he was born. Married on February 3, 1897, Mr. and Mrs. J. W. Crist had two sons and three daughters, two of the girls however not living to womanhood.

Embracing technical advances in the foundry art as they developed, Mr. Crist has adopted pouring temperature, sand tests, chill tests, and other controls to the betterment of his output. Particularly expert on foundry rigging and equipment, he has been likewise successful in arriving at good gating and risering practices. In the training of apprentices also his results have been noteworthy.

A special foundryman in every sense of the term is J. W. Crist.

J. W. Crist

The Federal Credit Union

Its History and Its Purpose

"A Federal credit union is hereby defined as a co-operative association organized . . . for the purpose of promoting thrift among its members and creating a source of credit for provident and productive purposes."

—Federal Credit Union Act

THE growth of the credit union movement in the United States, has amazed even its most ardent advocates. This plan for workmen's loans and savings associations did not have time to fully explain itself, or to be publicized, before its enthusiastic adoption all over the country had become a national phenomenon. Nothing could better prove the need for such a system and its benefits.

A credit union is a thrift and loan association composed of a specified employee-group whose pooled savings provide a fund for loans to its members at a reasonable interest rate. A common bond of occupation, such as employment in the same plant, must exist as a basis for each union, and it does business only with persons within the group it serves. Employees forming the credit union have complete charge of its administration, and it operates solely to serve its membership.

The need for some method of handling credit co-operatively has long existed. The heavy toll exacted by the usurer and pawnbroker from distressed borrowers, has been the subject of tragic tales of fact and fiction down the centuries. The effort to combat this vicious practice of profit from misfortune has gone hand in hand with human progress.

The suffering of people in low income groups from this age-old vice of usury, became especially acute in Europe a hundred years ago. There it was that the idea underlying the principle of the credit union was born. There it received its first practical application and, in time, the impetus by which it spread to other continents.

The present world-wide co-operative credit movement began in Germany, nearly a hundred years ago. Two loan societies, one in central Germany, the other in the Rhine country, grew out of destitution wrought by disastrous droughts and attendant famines in 1846 and 1847. One was a system that aided the farmers in rural districts. The other was a formation of so-called "people's banks," to serve tradesmen and artisans in the small towns and cities. Both plans flourished and gave such material, social, and spiritual aid to the beneficiaries, that they became firmly rooted in the national economic life.

Supervisory Committee, Radford: Mrs. Kathryn Howell, Macon P. Miller, Miss Eloise Hurt

Officers and Directors, Federal Credit Union, Radford Works
Seated, left to right: W. H. Martin, President; Jess Baker, Vice-President; Claude O. Harless, Secretary-Treasurer
Standing: J. W. Stewart, J. L. Clements, W. H. Blankenship

The name of Wilhelm Raiffeisen, burgomaster of the district of Flammersfeld, Germany, has been given to the rural plan which he originated and directed. Deeply religious, and moved to almost fanatical fervor by the suffering around him, he devoted the later years of his life entirely to the task of teaching the German peasants to help themselves through co-operative means. As the "Good Father Raiffeisen" he came to be so revered by them that he was regarded as a special patron saint.

The founder of the urban system of "people's banks" was Herman Schulze-Delitzsch, who sought to do for the shoemaker, the weaver, and the other small artisans what the Raiffeisen societies did for the farmer. The first bank of this sort was set up at Eilenburg, near Leipzig, in 1850. Schulze-Delitzsh, long prominent in German political life as a pronounced liberal, likewise devoted his later years to the co-operative movement he started, and saw it expand enormously before his death in 1883.

These movements in Germany soon attracted attention abroad, and were being watched closely by many other countries. Inspired by their success, Luigi Luzzati, a brilliant and wealthy young economist of Italy, in 1866 started a similar system for the Italians with the "People's Bank of Milan." Eventually 3,000 other banks, adaptations rather than copies of the German model, were operating in Italy. A modified Raiffeisen plan was introduced in rural Italy, in 1883, by another young Italian, Leone Wollemborg, and this too made rapid growth.

The German plans were later adopted by other countries of Europe, with such variations as were necessary to fit them to the need in each instance. The total runs into the tens of thousands, and after covering Europe extended to other continents. Since 1900, in Japan alone more than 13,000 co-operative credit societies had been developed by 1934. India, however, leads the world in organizations of the credit union type. Here the passage of a law in 1904, amplified in 1912, setting up credit societies of the Raiffeisen order, in both urban and rural districts, has resulted in the most widespread application of the co-operative principle on the globe.

It was at the beginning of the twentieth century that the credit union idea took root in American soil. In 1900, Alphonse Desjardins, a journalist, after studying European systems for fifteen years, started an experimental society at Levis, Quebec. This Canadian plan started with rural parish branches, but was altered considerably from the original, as the founder proceeded slowly and cautiously to set up the system dictated by the need. His type of bank also proved its workability, and before he died in 1920 more than a hundred had been established.

In 1909, at the request of Pierre Jay, Bank Commissioner for Massachusetts, Desjardins came to Boston to a conference called to consider adoption of the idea by the State of Massachusetts. As a result of this conference a bill was drafted for presentation to the legislature, and that same year it became a law. Edward A. Filene, wealthy Boston merchant, recently returned from a round-the-world trip during which he studied the systems in Europe and Asia, gave the bill ardent support in committee hearings, and aided greatly in its enactment. In Massachusetts, therefore, was definitely launched the credit union movement of the United States, although meantime Desjardins had helped set up among the French Canadians of Manchester, New Hampshire, what became the first Credit Union to actually operate in the States.

While this was going on, the credit union idea was being fostered independently in other places. Leonard G. Robinson as early as 1907 had urged credit co-operatives among Jewish agricultural colonies which he managed, and in 1911 the first of such credit societies was started at Fairfield, Connecticut. A bill for rural credit unions had been introduced in the New York legislature by State Senator Franklin D. Roosevelt, which was later withdrawn in favor of the broader act voted in 1918. North Carolina passed a credit union law in 1915, largely at the instance of John Sprunt Hill, a Durham banker who studied the European systems as member of a Commission appointed by President Taft.

Educational Committee, Radford: J. L. Clements, W. L. Nye, Roy Mayberry

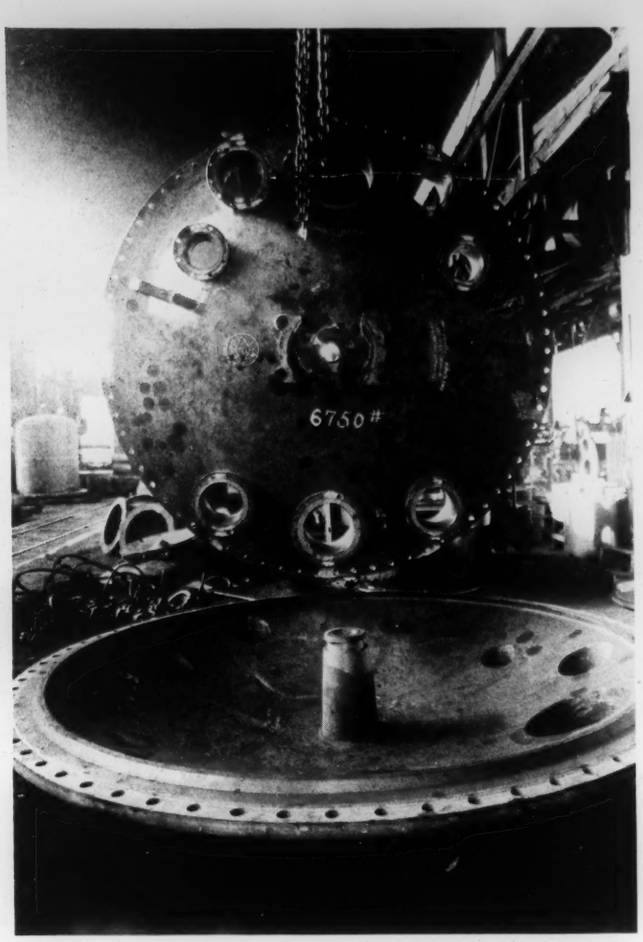
Credit Committee, Radford: Coy Franklin, W. Y. Andrews, Rudolph Howell

As the credit union developed in the United States it assumed a form of its own, differing in many details from the parent societies. Its most radical departure was that here it become an organization of consumers, whereas elsewhere it had been essentially an association of producers. In India a small percentage of credit societies serve payroll groups, and lately Palestine has seen a similar development. However, in other countries consumer credit associations have not yet been set up, and European students of co-operation regard our credit union as an experiment of a new type.

Massachusetts continued to lead in credit union progress after enactment of its law of 1909, and Edward A. Filene became the sponsor of an effort to establish a great nation-wide system. In 1921, with 190 credit unions in the United States and 72,000 members, the movement finally got underway. Mr. Filene joined forces with Roy F. Bergengren to form the Credit Union National Extension Bureau with a fourfold object of securing state and national legislation, setting up new credit unions everywhere, building up a network of state leagues, and finally creating a national association of credit unions.

This campaign started slowly but gathered momentum, until State after State fell in line with credit union laws, all but seven rapidly voting such legislation. In 1932 Congress gave the movement its approval by passing a credit union act for the District of Columbia. In June 1934 it enacted the Federal Credit Union Act, providing for Federal chartering and supervision of credit unions. The credit union thus became a full fledged American institution.

IN THE SERVICE NOW!



Covers for Pressure Vessels in a Chemical Plant

Bently C. Turpin, Jr.

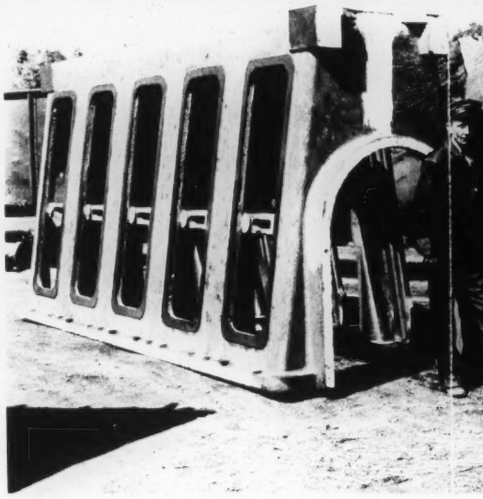
Arthur P. Figg

J. Gordon Phillips

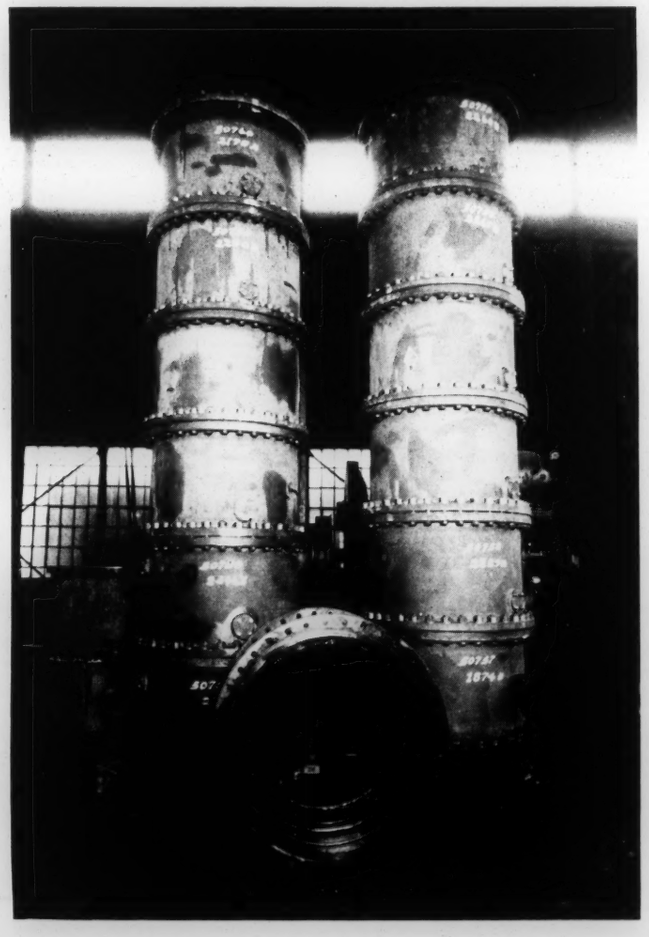
St. Elmo Hawkins

William P. Matthews

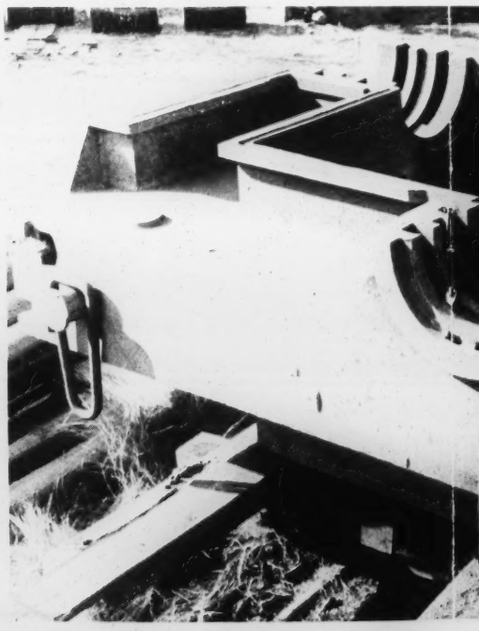
Condenser Castings for



Marine Engine Castings (

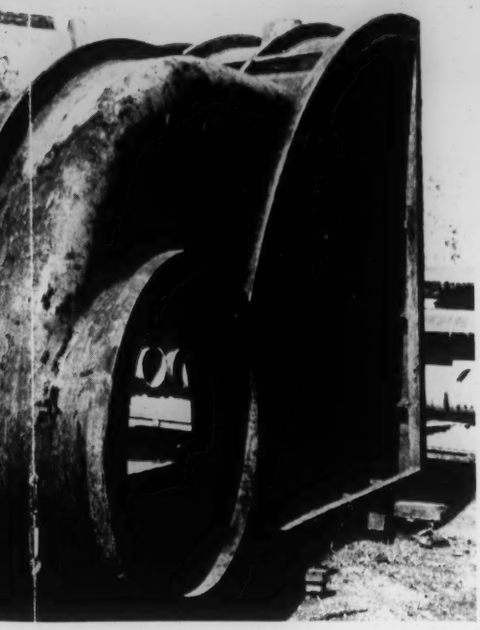


Chemical Plant Equipment. (Tested at 150 lb. per sq. in. air pressure)

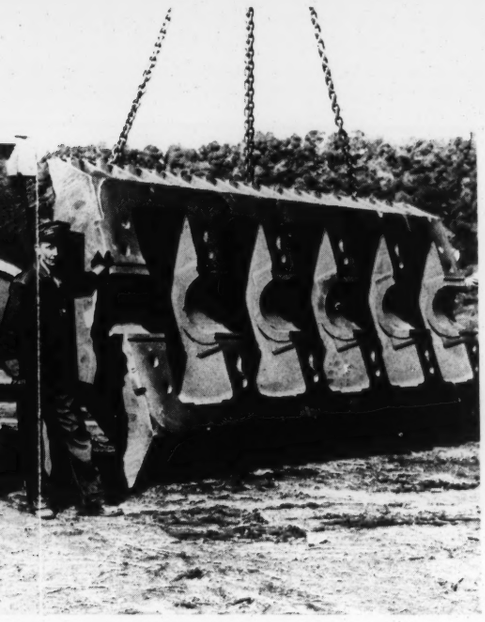


Gear Frame for Steel

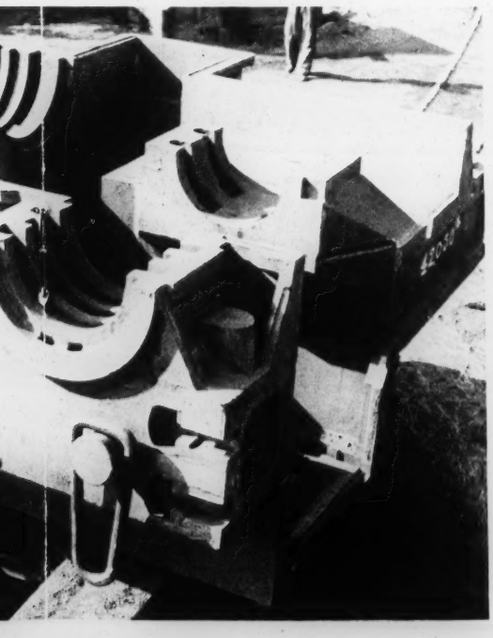
MEN AND MATERIEL FROM LYNCHBURG FOUNDRY CO. SHOPS



tings for Power Plants



tings (Weight 24,000 lbs.)

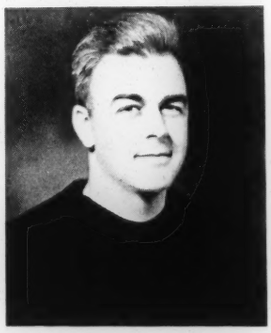


or Steel Mill Equipment

Walter H. Turpin

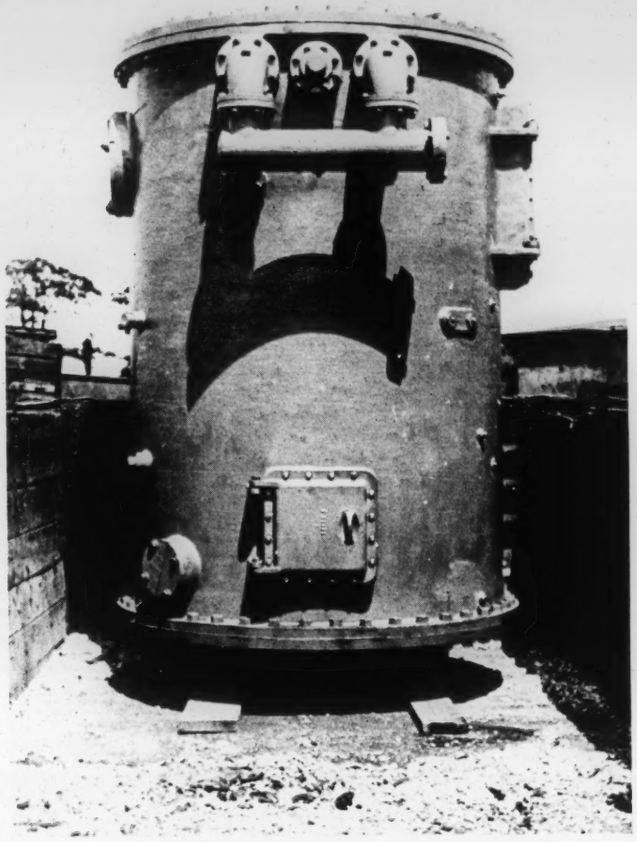
Lloyd C. McNeill

Donnie F. Hawley



Robert A. Hall

H. H. Holland



Item of Chemical Equipment for Arsenal Installation

Casting Used in 200-inch Gear Hobbing Machine. (80,000 lbs.)

The Lynchburg Laboratory
SHIFTS TO WAR GEAR

By Jarl A. Havnen, *Assistant Metallurgist*

Jarl Ambrosius Havnen ("Jerry" for short), native of Duluth, Minnesota, joined our organization early in 1942. Previously he had worked in the field of mechanical engineering and had been an instructor at the University of Minnesota, Minneapolis. Lately he has had occasion to put his teaching experience to good use in the training of laboratory technicians, and has met difficult war conditions that bear heavily on his department with enviable success.

THE Lynchburg Foundry Company has practiced scientific sand control for many years. In 1924, General Manager Max Kuniansky, at that time Chief Metallurgist, established our first sand laboratory at the Lynchburg Plant. Harry W. Dietert, long recognized as the outstanding authority on sand testing, and principle manufacturer of sand testing equipment, states that Mr. Kuniansky was one of the first representatives of the foundry industry to purchase equipment from him. The equipment, all of Harry W. Dietert design, enabled Mr. Kuniansky to check and control accurately three very important molding sand properties: permeability, green shear strength, and moisture content. Sand testing, under the direction of the metallurgical staff, and the correlation of laboratory test results with actual shop results have been an important phase of our control program since that time in both our Radford and Lynchburg plants.

(2) Routine Sand Testing by Roy Frye

(1) Mrs. Gwaltney Doing Routine Sand Testing

In 1941, at the suggestion of Wally Levi, Chief Metallurgist, our present sand laboratory was built at the Lynchburg Plant. The laboratory was equipped with the most modern apparatus available for both routine sand testing and sand research. In addition, apparatus for the rapid determination of the carbon content of cast iron was installed in the laboratory.

The original personnel of the new laboratory was all male. Since the war program has created the man-power shortage, women have been trained to carry on the testing program so that the men might be released for work in other departments in which the nature of the work made it impractical to place women workers.

With all the modern sand testing equipment, the three sand properties originally tested have not been forgotten. Green strength, permeability, and moisture content of every sand heap in the shop are tested daily. This means that every day one-hundred-twenty samples are obtained from the Plow and Special Foundries and

(3) Mrs. Curfman Mixing a Sample of New Molding Sand and (4) Grinding Iron Sample for Carbon Determination

tested in the laboratory. In Fig. 1, Mrs. Dean Cox Gwaltney is seen testing the Plow Foundry sand. Mrs. Gwaltney, a former public school teacher in Nansemond County, Virginia, is the latest addition to our laboratory force. In the foreground in Fig. 1, the sand samples to be tested are lined in order on the table. Mrs. Gwaltney is weighing sand for a moisture determination in the Rapid Moisture Teller located at her left. Other sand testing equipment shown in Fig. 1 is the laboratory sand muller, drying oven, specimen rammer, permeability machine and Universal strength machine. The routine sand testing was formerly done by Roy Frye, shown in Fig. 2 and Ralph Perdue who is now in the United States Marine Corps.

Another phase of our sand control program is the testing of all new molding and core sand received at the Lynchburg Plant. Samples of new molding sand received at the Radford Plant are shipped to the Lynchburg laboratory for complete testing. By testing each carload of new sand received, we are able to determine whether or not the material meets our specifications. Samples of new sand sent on trial by various suppliers are tested to see if the sand would be suitable for our work.

In Fig. 3, Mrs. Louise Van Lear Curfman is seen mixing a sample of new sand in our laboratory muller.

(5) Joe Burnette Weighing Carbon Sample

Mrs. Curfman was the first woman to be employed in the laboratory and, for that matter, in the whole shop. She was formerly a teacher of English, mathematics and science in the Covington High School, Covington, Virginia.

Figs. 4, 5 and 6 show various steps in the determination of the carbon content of a ladle of special high strength iron. Speed in handling every step in the analysis is essential if the results are to be obtained before the iron is poured. On reaching the laboratory, the sample is beaten into small pieces with a mortar and pestle. This step is illustrated by Mrs. Curfman in Fig. 4.

(6) Mrs. Russell Making Carbon Determination

Joe Burnette, formerly employed in the laboratory and now working in the wood pattern shop, is shown in Fig. 5 weighing the sample on an analytical balance.

The final stage in the analysis is shown in Fig. 6 with Mrs. Adelaide Dagoff Russell making the determination. Mrs. Russell is the wife of David M. Russell, formerly with our Sales Department and at present with the United States Army Air Corps. The carbon determination, from the time the sample is poured until the result is telephoned to the Special Foundry office, takes between seven and eight minutes. With normal melting and pouring temperatures, the carbon analysis is received in the shop before the ladle of iron has been poured into the mold.

Figs. 7 and 8 show other jobs performed by the women in the laboratory. In Fig. 7, Mrs. Russell is drilling a sample of iron poured into a large cylinder head destined for an aircraft carrier. The drillings are to be sent to our Radford laboratory for complete chemical analysis. Mrs. Curfman is shown in Fig. 8 testing prop-

(7) Mrs. Russell Drilling Iron Sample

erties of a molding sand mixture at 2500 degrees Fahr.

Because of the need for very rigid control of war materials and products, and in spite of the man-power shortage, our laboratory is working efficiently at top speed. Mrs. Curfman, Mrs. Russell and Mrs. Gwaltney all have children. Their ability and willingness to perform difficult, painstaking, and sometimes tedious work is indicative of the spirit that will achieve complete success for our total war effort.

(8) Mrs. Curfman Testing Hot Strength of Sand Mixture

Elected to National Office

At its second War Production Congress held in St. Louis on April 28, 29, and 30, the American Foundrymen's Association elected Max Kuniansky, Vice-President and General Manager of the Lynchburg Foundry Company, to serve on its Board of Directors for a term of three years. Mr. Kuniansky has long been active in Association affairs, and especially in its research program. Currently his chief responsibilities have to do with the Cupola Research Committee of which he is a charter member. As chairman of its sub-committee on scrap, and chairman also of its more recently established finance committee, he has part in directing studies regarded as highly important in the war effort.

In a biographical sketch appearing with his picture in the pre-convention issue of the American Foundryman magazine, Mr. Kuniansky's life story is termed a "typical American Odyssey." It announced that his name would be put before the convention by the nominating committee, and summarized his foundry accomplishments including the award to him in 1941 of the McFadden Medal for outstanding contribution to the entire foundry industry.

Gremlins Between the Covers

Gremlins, as of course all know by now, are those pesky little devils borned by the RAF to explain the endless troubles that beset flyers and their machines. Since getting into the news they have been popping up all over the place, stories about their dirty work coming along with war bulletins of press and radio. We admit a sneaky feeling that *gremlin* is just a new word to replace worn out old *alibi*. But that does not mean that we are laughing 'em off. The truth of the business is that the darned little mischief-makers have been busy right here in our own bailiwick. (We've been on the hunt for them and we think we've hit a few, but we still see tracks every now and then.)

The worst attack suffered by THE IRONWORKER at the hands of the gremlins was that caption under the picture of a naval casting that made it an engine base for a Liberty Ship. Then the imps stole a whole line of type from a group of apprentices, leaving six of them entirely nameless. And their tampering with the Honor Roll shows their utter disrespect for sacred spots. They even dared to take liberties with an executive title.

A magazine feature in rhyme, published by the distinguished *New York Times* tells of "The Gremlin in the Kremlin." This gives cause for deliberating before passing judgment on the marauders. If the Russians can put the gremlin to good use against the Nazis, then let's call off all hunts. May his tribe increase!

Required For Plant Protection

IN years gone by plant protection was largely a matter of protection from fire and theft. Today, because of scarcity of supply, industry must guard more than ever against fire and theft. In addition it must guard against new dangers brought on by war: sabotage, espionage, and subversive activities.

Ugly words are these names for enemies within, words of foreign origin associated in our minds with dangers foreign to the United States. But suddenly brought to face their dread meaning we have had to take them into our speech, and into our daily thought.

Ugly things have to be dealt with in ugly ways. And many ugly ways are having to be learned in the prosecution of this war. Because the end justifies the means, the end is what counts. If it is going to take enemy methods to win this war, then we will adopt enemy methods.

Barricades, guards, fingerprints, and identification-passes are to Americans earmarks of crime. Peaceable, law-abiding citizens have had no knowledge of them except as police measures. This thinking has had to be put aside with many other pleasantries "for the duration." These ugly things now spell safety and security.

Companies producing war materials have been required to enforce plant protection along certain prescribed lines set up as standard. Guards trained in detection and for quick action in emergencies, have replaced the old fashioned watchman. Operating areas have been enclosed, and entrances so arranged as to safeguard all approaches. Employees are fingerprinted and photographed for identification, and must wear badges to go and come about the shops.

These things done by the Lynchburg Foundry Company have been accepted by our employees in proper spirit. Of all the new processes of war they have perhaps been in sharpest contrast to old habits, and have tasted most of flavors we dislike. But, again, this is war, and we are on the production front.

A fingerprint card for each employee has been made and filed with the designated government agency. On the card are impressions of all fingers, and a complete description of the person. Upon receipt of the card a check is made that affords a protection highly important in war work. If the fingerprints turn out to be those of someone with a "record," officials are notified immediately.

Of all these ugly things required now for our well-being, there is no question whatever as to the ugliest. Those photographic badges win that distinction hands down. How anything quite so ugly could be achieved might be a great mystery if we did not happen to know that there's absolutely no trick to it at all. You just take your place before the lens, look pleasant, and natural, and there you are!

Finger-Printer and Subject
(T. M. Bost, Jr., and Charles A. Scott)

Using plant equipment and facilities for developing and printing, Company amateurs, with admirable ingenuity but ruthless artistry, have made these pictures of all employees. No rogues-gallery or police line-up ever offered finer specimens of plug-uglies.

(The editor was ready to stake bets on his own against all comers until he saw the president's and withdrew in his favor. You are warned not to brag that yours is the worst until you have seen these.)

A negative camera arranged on a frame does this remarkable job of face-making. The frame shows the badge number on the employee's chest, giving the height in the background. The badge is so made that it cannot be used for a second picture. This eliminates any possibility of someone else getting the badge and substituting his own picture in order to enter the plant.

If wearing caricatures of ourselves is part of the Plan For Victory, then the ugliness matters not one whit. Anyway, who knows but what these production-soldier decorations of today may become prized heirlooms of tomorrow? We may live to be downright proud of the old mug. It may even someday win a place on the antique whatnot between Aunt Minnie's tin-type and Grandpappy's moustache cup.

Look Pleasant, Please!
Lynchburg Line-up. (General Office Studio)

Radford's Special Foundry Plays Its Part

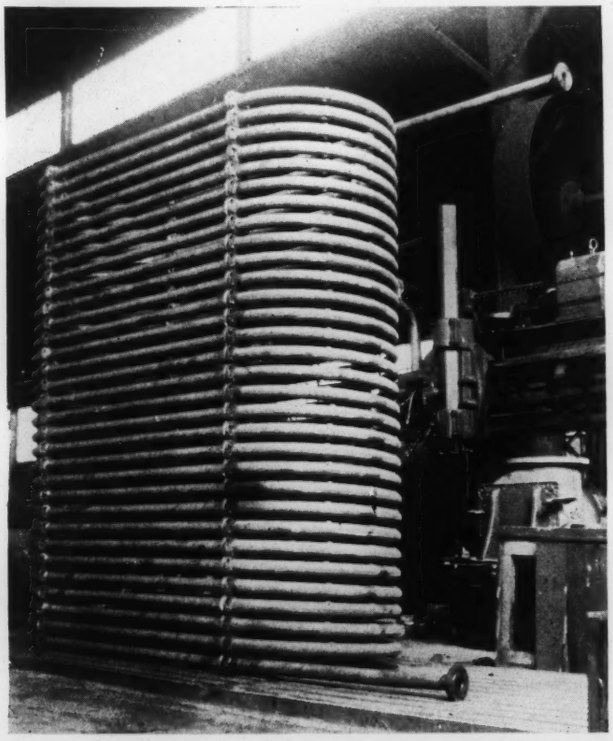
By Fred W. Hurt, *Employment Manager, Radford Plant*

(Of a long line of Virginia ironworkers, Fred Hurt was born with a natural foundry bent. His successive Company positions, covering a wide range, have given him keen insight into our products and practices.)

No single department in our company has had a bigger job in converting to wartime products and in meeting demands for increased output of these products than our Radford Special Foundry. This is noteworthy because up to a few years ago the products of this department were, in the main, cylindrical castings such as pipe fittings and caustic kettles. Any casting of intricate design which deviated from this general pattern was considered difficult and likely to result in casting losses and excessive costs.

Under the present pressure for war materials the question is no longer if we shall try it, but rather how we shall do it. Our foundry has thereby gained a reputation for willingness and ability to turn out work that many other foundries consider too great a risk to attempt.

This department's increase of output is revealed in figures showing that its production tonnage for April 1943 was approximately three times the average monthly tonnage for 1939. Such accomplishment is a worthy record when made in the face of today's manpower problems plus all the difficulties inherent in any conversion to new products.



A Lynchburg Foundry Company Special Casting Unit of Castiron Coils Used in Tar Distillation Plant

In Radford's Personnel Office: Mrs. Eunice Austin at files, Miss Elizabeth Williams at typewriter, Fred Hurt at desk

Former employees of this department now in military service total twenty-three per cent of its present enrollment. Its highly trained force of four years ago suffered this depletion at a time when replacements with trained molders and coremakers were impossible. Fifty per cent of the current employees have worked at their present jobs less than eighteen months. Under such adverse conditions the trebled output has been effected.

The excellent record of this department cannot be attributed to any single innovation or idea but has come as the result of close cooperation on the part of its entire personnel. Perhaps the greatest factor has been in the careful placement and training of the workers.

Seven men from this department, three foremen and four workmen, completed the Job Instructor Course offered by the War Production Board and installed its system of training in the shop. The principles of its program have been followed closely, enabling new men to perform useful service in the shortest possible time. Operations requiring skill are no longer learned by merely "helping" or "looking on" but by having the new man start immediately to turn out work of value.

While it may still take years to learn all of the skills required of a finished molder, it takes only hours to learn to ram, stand, set and secure cores, or shake out a casting. This foundry now has groups of men who have specialized in many particular parts of the molding process, so that while one group is ramming, another may be assembling cores and closing up, and perhaps still another removing a finished casting from the sand.

In the selection of people for the different jobs in the foundry, it has been noted that certain basic skills are acquired in many different trades, some of which on first thought appear entirely unrelated. As an illustra-

tion, it has been found that a good carpenter will make a good coremaker or core assembly man. In his trade the carpenter has learned to measure carefully, to work to close requirements, and to visualize the object he is creating or the purpose he is trying to achieve. All of these qualities are necessary in the making and assembling of cores.

Much upgrading has been done after careful observation of workers to detect indications of interest and initiative. It has been found that the man who has the willingness to try, will in nearly all cases become the man who can do the job.

Another valuable contribution to increased production and improved quality of work has been in the more general use of oil sand. In former years this type of sand was used almost exclusively in making cores, whereas today an entire mold may be made of pre-baked oil sand segments. The use of this sand, with its high degree of permeability, great strength and excellent casting surface, eliminates many of the possibilities of casting losses inherent in the process of ramming green sand against a wood pattern. The use of baked oil sand cores and mold segments therefore permits the use of less skilled workmen, and frees more highly trained molders for supervision and other work that demands their greater degree of skill.

Many improvements in arrangement of work, better handling of equipment to clear valuable floor space, and new designs in patterns and equipment, have also assisted materially in the achievement of this record.

Not to be overlooked is the spirit of loyalty and patriotism of the men who have worked long hours without complaint to produce materials vitally needed in the services. We know that theirs is the satisfaction that comes with the knowledge of a job well done and that they will continue to attain even greater honors on our industrial front.

Wilmer H. Lawrence, Special Foundry Superintendent, Explains Coremaking to Radford's First Foundrywomen: Mrs. George Linkous, Mrs. Pauline Moore, Mrs. C. S. Quesenberry, and Mrs. Dewey Woods

Young Veteran

WILMER H. LAWRENCE, Superintendent of the Radford Special Foundry, is one of the Company's outstanding young veterans—young for position of great responsibility, yet trained and experienced. Not in his years will be found the measure of his qualifications. Rather in his capacity to make every year count seems to lie the secret of his success.

Wilmer Henry Lawrence was born in Radford on March 5, 1910. His father, Henry Lawrence, had at that time been with the Lynchburg Foundry Company for four years and still is of its active personnel. Thus, reared almost in the shadow of the Radford Plant and with his father's example as a foreman to guide him, he got off to an unusually early start as a foundryman. And an unusually good start as well.

Sometime in his early youth, Wilmer was able to dispose of his very dignified first name and become just plain "Bus," as he is now known. At sixteen he began to work at the Foundry as a laborer, and continued through vacations until he graduated from Radford High School in 1929. In September of that year he entered the University of Virginia, and after a year there returned to work expecting to resume his studies at Charlottesville later. Dan Cupid changed this plan.

On June 18, 1932, "Bus" was married to Miss Myra Greiner. Mrs. Lawrence, in addition to giving her attention to their lively two sons, Wilmer Roger, age 9, and Robert Mayberry, age 8, finds time to teach school, serve as a member of Radford's Recreation Commission, and take part in many other civic and religious movements.

As a secondary interest, "Bus" finds relaxation following athletic events. This is the natural continuation of his once active participation in sports. In high school he played baseball, basketball and football. At the University of Virginia he won numerals in football, baseball and boxing.

At the Radford Plant his work has included a period as molder's helper, as an apprentice pattern maker, and eight years in the Standards Department. Of great value in his present work is the experience and knowledge gained in estimating and planning on special castings with the Pattern Shop and Foundry. He became Superintendent of the Special Foundry in September 1941, after two years training under the able Frank E. Stump, tried and true foundry veteran.

The record of the Radford Special Foundry in meeting the challenge of the shift to new war products, the greatly increased production of castings, and the quality of the output, speak highly of Wilmer Henry Lawrence as a business man. His standing in the community and his interest in civic affairs speak highly of him as a citizen.

Top-rank Foundrywoman

Photograph by Bachrach

Agnes Moran, Manager New York Sales Office

ON April 11, 1943, Miss Agnes Moran, manager of the New York sales office, counted off twenty-five years since that day in the midst of the other world war when she enlisted with the Lynchburg Foundry Company. It was in Radford, at the plant office, that the young rookie of 1918 began her career as an ironworker. The long way from the banks of New River in Virginia, her birthplace and first love, to the skyscrapers of the Hudson, is indicative of how far she has come in her rise as a foundrywoman.

When, after Radford High School and National Business College, the new "general office worker" took up her duties no other feminine employee, except the Company nurse, had broken the dull monotony there of all-masculine personnel. Until her transfer to New York on May 1, 1932, she was as much a part of the Radford scene as the plant itself.

There was an interruption of three months in this quarter-century of service, due to conditions typical of those days in Radford. Agnes Moran found the temperamental schedule of the old West End trolley so exasperating that she decided to take a job near her home so as not to have to depend on its uncertainties. On October 1, 1920, she left the Lynchburg Foundry Company to work for the Norfolk and Western Railway. On December 15, following, she was laid off indefinitely under seniority rules of the railroad. After a three-day vacation she called at the pipe shop to ask for her old job back. Mr. Roberts, she says, told her he had expected her to return and for that reason had not cancelled her insurance. She took up where she left off, and with only that brief intermission has seen continuous service for the historic two-war span, 1918-1943.

In her years at Radford Miss Moran came to know the employees and their families in a personal way not possible under today's conditions. Her genial nature and varied capacities won her such a big place in plant affairs that even promotion could not reconcile many friends to having her leave for broader fields. The schooling there was not only in every detail of foundrying but in all the humanities as well. It was good schooling and Agnes was a good pupil.

Helping Dr. Fuqua with his office dressings was one of the Moran specialities in the 1920's. Many men still in the shops, have cause to remember her talents as a surgeon's assistant in emergencies. Her native resourcefulness is illustrated by an incident reminiscent of those days when both Company and community facilities were far short of present standards.

Dr. Fuqua happened to be out of town for several days at school-opening time. To meet the vaccination requirement for entering, a child was sent by his mother for Miss Moran to "fix." Not wishing to compete with the medical profession, she decided not to go so far as to vaccinate, but neither was she willing to have him miss school on a mere technicality. She simply applied a bit of camouflage. With a dab of cotton colored with iodine, and a neat cross of adhesive she decorated the left arm in just the right place above the elbow. The child went to school, was never questioned, and when Dr. Fuqua got back vaccination was duly performed.

Agnes Moran knows cast iron pipe and fittings all the way from their native ore beds to finished installation in complex engineering projects. She is as accomplished a foundry prima donna as ever trilled her tees. Her success should be a real stimulus to young ladies just now learning to be ironworkers. Her pioneering twenty-five years before women generally discovered the attractions of heavy industry, makes her a veteran in what is regarded currently as a newly opened field. That she was put in charge of the New York office in March 1938, when this was still a highly competitive man's world, attests the quality of her attainments.

Shop Visits

To get better acquainted with personnel and processes on the scene of action, Miss Vivian Cristol and Miss Virginia Kearney, associates of Miss Agnes Moran in the New York Sales Office, recently visited Lynchburg and Radford. Mrs. Eloise Snead of the Order Department, General Office, was their official guide and hostess.

For the same purpose, groups from the Lynchburg office made a Spring visit to Radford with Tommy Bost as chief guide and commentator. Robert Rose took a contingent composed of Miss Desmond, Mrs. Patterson, Mrs. Ford, and Miss Figg. Al Cronin took Mrs. Watts, Mrs. Smith, Miss Rice, Mrs. McAden, and Mrs. Walton. Gordon Payne had in his party Miss Bell, Mrs. Crank, Mrs. Shelton, Mrs. Barton, and Miss Jackson.

Visitors and Hostess

Mrs. Ben Snead of the Lynchburg Office, Miss Vivian Cristol and Miss Virginia Kearney of the New York Sales Office Standing Inside a large casting at Radford on their Tour of the Shops

Mr. Shelton and Secretary, Miss Virginia M. Jackson

Richard Swanson Shelton, born in Pittsylvania County, Virginia, held bookkeeping and auditing positions with several prominent Lynchburg firms before becoming auditor for our Company July 15, 1928. In the last war he served as first class petty officer in the U. S. Navy. On November 25, 1925, he was married to Miss Margaret M. Scruggs and their daughter Margaret Ann is now a young lady of thirteen. Keeping abreast of new and improved methods in the world of finance by such means as advanced courses in the Walton School of Commerce, Chicago, Shelton was well qualified for promotions that brought him to his present office September 27, 1940

Management and Personnel Policies of the Auditing Department

By R. S. Shelton

Auditor, Secretary, and Assistant-Treasurer

(The mounting complexities of his job of keeping Company forms and figures in proper wartime shape, find Dick Shelton's characteristic calm and efficiency quite unperturbed. How he does it may be seen in part in this statement of some of his policies. Results in his department indicate that he applies his studies in personnel as wisely and as well as his studies in accounting.)

MANAGEMENT has been defined in very simple terms as "getting things done through the efforts of other people"; this function consists of two major responsibilities, one of which is planning, the other control.

In planning in the Auditing Department proper systems must be devised and installed to record and preserve all information pertaining to Company operations. There was a time when such planning was a comparatively simple task. However, in recent years with the ever increasing number of monthly, quarterly and annual reports required by Federal and State governmental agencies any system is subject to revision over-night, as no one can anticipate future additional information to be required by such agencies. If any system is to function successfully, it must be modern and yet be simple and understandable.

Control requires proper training of personnel to do the work in accordance with the plan. The Auditing Department for sometime has adopted a policy which is based on actual experience — that an employee must thoroughly understand his duty and know and be told when a job is well done to be happy with the work assigned him. No one can perform his duties in a satisfactory manner if he is afraid of his job. For this reason, when it becomes necessary to make a change in the personnel of this department, the new employee is thoroughly schooled in his assignment by his superiors until he is familiar with the duties and responsibilities of his job. He is not only shown how a job is done but is shown why it must be done a certain way to tie in with our general accounting procedure.

To thoroughly train a new employee requires considerable time and patience. The question then arises: Does such thorough and rigid training pay dividends in efficiency and speed? Our experience has proved that an employee of this department after proper training can practically do the work of two employees who are not thoroughly trained.

A potential, capable employee may become discouraged and fail to make good simply because he is hired, told in a brief manner his duties, then forgotten and left to figure out for himself all the details of his assignment. It is very unfair not to try to train new employees so they may be given an even chance to make good.

Unless the organization structure is simple and unless all who are a part of it understand it, it will defeat its own purpose, which is to enable people to work together in groups as effectively as they would work alone.

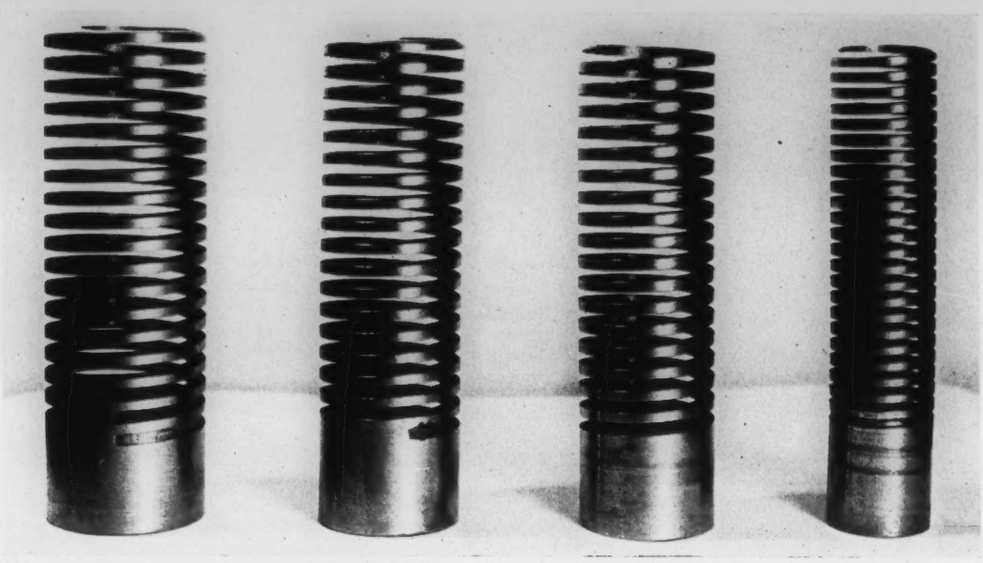
The function of supervision is to close the gaps between desired performance and actual human performance. If the mere issuance of policies and instructions would induce people to do what they are supposed to do, supervision would not be necessary.

Having divided the activity of management into two basic elements of planning and control, it is simple to arrive at a statement of the primary executive function —to determine what you want people to accomplish, to check periodically on how well they are doing their jobs and to devise methods by which they will perform more effectively.

This leads us to a rather simple truth: Management is the development of people and not the direction of things. If this fact were more generally accepted, many management difficulties would disappear. The executive or supervisor who says that he would rather exhaust himself doing things correctly than expend the time and patience necessary to get other people to do them correctly is admitting he cannot manage.

Since management requires staff and line activities, it is natural to divide personnel functions between staff and line executives, providing each appreciates the significance of the other. Line executives have complete and final responsibility for personnel matters and final authority for them. Staff personnel executives are expected to advise, help and be of service to the line executive in the fulfillment of these responsibilities. There is an important place for both in any administrative setup.

Many volumes have been written on simplification of management and personnel problems, all of which could be put in one simple sentence—"Do unto others as you would have them do unto you." There, in one sentence, is the greatest book ever written, on the greatest subject there is, by the Greatest Author that ever lived.



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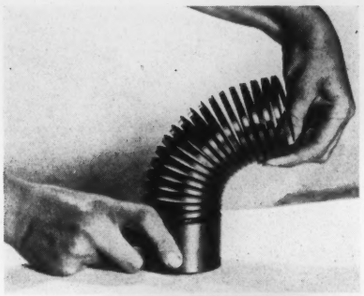
A Demonstration of Iron Workability

(Photographs by Bremer, Lynchburg, Virginia)



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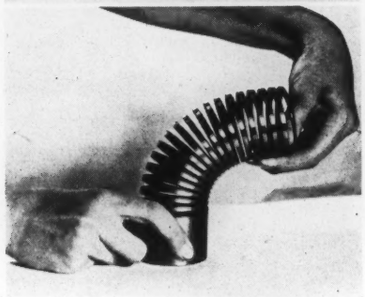

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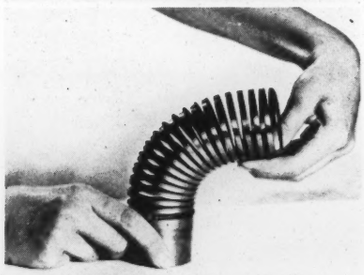

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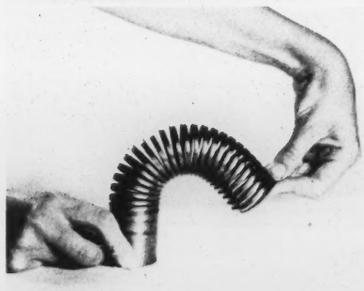

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Springs Of Cast Iron

By W. Levi, *Chief Metallurgist*

The accompanying photographs are of cast iron coil springs machined from the walls of four different Lyncast castings produced at the Radford, Virginia, plant of the Lynchburg Foundry Company. For those not entirely familiar with the significance of the word "LYNCAST" it is well to point out that it is a registered trade mark denoting a series of classes of high quality cast irons made in accordance with a patented process developed by Lynchburg Foundry Company.

The four springs standing straight up were machined from commercial castings made on a production basis: From left to right the castings from which they were machined, and the metal sections represented, are as follows:

1. Machined from 2⅝″ metal section of five (5) cylinder Marine Engine Frame. Estimated weight: 22,600 pounds.

2. Machined from 2¾″ metal section in wall of barrel of 48″ x 70″ Low Pressure Marine Engine Cylinder. Estimated weight: 23,000 pounds.

3. Same as No. 2 except from another Low Pressure Cylinder.

4. Machined from 1¾″ wall section of Caustic Pot used in the chemical industry after the pot had served its useful life at approximately 800° F. Estimated weight: 20,000 pounds.

The other four pictures are of the same cast iron coil springs and were taken to illustrate the strength and toughness of the irons in question.

For those desiring more technical data, the following will be of interest:

CHEMICAL ANALYSIS

						PHYSICAL PROPERTIES ON 1.20″ DIAMETER BARS	
CASTING NAME	% Si	% S	% Mn	% P	% T. C.	Tensile Strength	Brinnell
Engine Frame	2.12	.044	.94	.16	3.05	44,900#	241
L. P. Cylinder	1.93	.058	.90	.17	3.16	46,860#	228
L. P. Cylinder	1.89	.062	.88	.15	3.33	45,910#	228
Caustic Pot	1.23	.068	.84	.14	3.60	36,245#	187

The Company can furnish Lyncast castings ranging in tensile strength from 25,000 p. s. i. to 65,000 p. s. i.

Civil War Relics for Radford Cupolas

Firing on the Foundry Front

1850 Cannon for Recast

The Show Is On

REHEARSALS are over. The show is on. America's vast continental expanse has become the setting for the gigantic spectacle in which we all have parts. Assignments have been made. Practice-time is past. Promptings are done. Performance is underway.

The Lynchburg Foundry Company has been given a part in the enormous supporting cast. Daily now it speaks its assigned lines. That those lines be progressively improved is its solemn obligation.

The unwritten law of the make-believe show-world must prevail in this show of actuality: *the show must go on!* For this show is WAR. "The People's War," "Total War," "Global War." We must play it well.

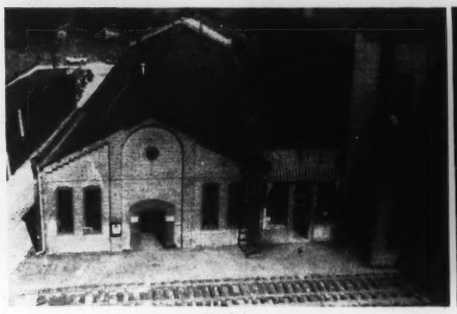
The bigger the show the greater the upset when any of its machinery goes wrong. Its collective effect can become only what the workmanship of its individual units makes possible. These units are flesh and blood, iron and steel. They are you and me, your tools and my tools.

Cues missed, lines fumbled, properties misplaced, are the dread of all producers but the accompaniment of every show. To prevent disruption when the hitches come, is the measure of ability. Industry especially knows this well.

The new raiment of the show now replaces our accustomed dress. Its strangeness makes us awkward and self-conscious at first but in time we wear it more naturally. Newcomers often with painful stage fright, fill in beside seasoned veterans of other war performances. Shifts are made here and there. Soon it all comes easier and the tempo is accelerated.

But so stupendous a performance, and so prolonged a run, overcomes early flaws only to take on new difficulties. Wear and tear begins to show on personnel and properties. Enthusiasm wanes. Spirits lag. Fatigue starts. Strains develop. Patience wears thin. Tempers are short.

None of these things can be allowed to slow or stop the show. To improvise and substitute becomes the everyday job. There is not time to settle disputes, to smooth ruffled feelings, to quiet tired nerves. Temperaments and prejudices must be put aside.



War Production Unit

Chiefs-of-Staff on Inspection

Veteran at His Post

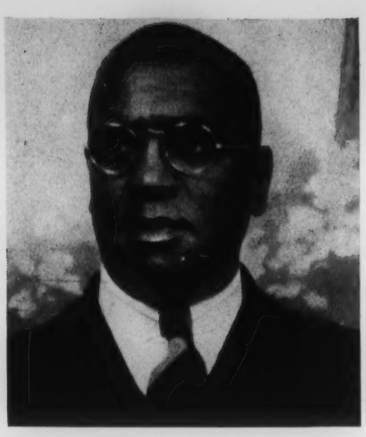
The lesson to be learned above all from the text-book of the make-believe world, is that things personal must be forgotten when the show is on. But at one important point the comparison breaks off sharply. That is at the matter of the audience. A radical difference here arises to stress what makes this WAR the show it is:

Players of the professional show-world have their audience at the moment to hiss or applaud, according to its reaction. The audience of this war performance is not yet present. Not until later will it assemble. Future generations will be the critics of the show that now engages us. On how the war is played today depends whether that audience of tomorrow will hiss or applaud. What will their verdict be? It's up to the players!

1918 Souvenir in Scrap Car

Three Musketeers of Lynchburg

Pattern for War Machine



New Horizons For The Negro Worker

By John T. Harris

Secretary Hunton Branch

Y. M. C. A.

Lynchburg

STRENGTH and endurance were for many years the prime requisites for workers in the iron and steel industries. In sections of the country where immigrant labor settled, the Irish, Poles, and Swedes, because of their racial sturdiness, gravitated in great numbers to these fields. Mingling with them, and predominating in places not yet penetrated by the influx of immigration, was the Negro. It is eloquent testimony to the physical excellence of the stock from which they sprang, that these workers stood out so prominently in an industry that exacted such stamina.

The ironworker of that day was a type readily recognized by his ponderously rugged physique. It was during this era that the Negro gained his foothold in industry. Legends of negro giants who could perform almost miraculous feats of strength and endurance, abound in histories of the development of America's natural resources. "John Henry," mythical giant of modern radio script, is drawn from one of these stalwarts recorded in songs and lore of levee, railroad, furnace, farm and forest.

That the Negro's hardihood was not ground out by the cruelties of slavery and the vicious health conditions under which he so often lived, is proof of its strength. As long as it was a case of brawn vs. brawn he was a keen competitor of those who crossed the "big pond" in the early days of United States industrial growth, to make their fame and fortune in the "Land of Opportunity."

These were the days, "the good old days" we have a way of saying, before technology had begun the industrial shift from physical to mechanical power. With the coming of this shift a new quality of workman was required. In the place of brawn came demand for precision, skill, speed, consistency, punctuality, clear vision and coordination of mind and muscle. Such qualifications call upon resources hitherto lightly drawn on, if not entirely untapped, during the reign of brawn.

These changes in the requisites for worker-efficiency gave the white worker decided advantage over his negro co-laborer. Contact, fellowship, information and inspiration ebbed and flowed between white worker and management in ways too plain to need enumeration. His eyes and ears thus opened to the changes taking place, he was prepared to move forward with the change. Soon a system of in-service training was set up and, later, programs of apprentice training. This served not only to improve the skills of those employed but attract-

Group of Lynchburg Foundry Employees at Hunton Branch Y. M. C. A.

Seated, left to right: James Vaughter, Edward Johnson, Edward Cox, Kermit Fitch, Samuel Kinney, Judge Hankins, William McKnight, Henry Hamler

Standing: John Marshall, William Dane, Irvine Gaines, Rodney Johnson, Percy Wood, Thurman Rose, John A. Turner, Jasper Cabell, Bennie Carter

John A. Austin

Retired Veteran

John A. Austin, faithful employee of the Lynchburg Foundry Company for thirty-eight years, has just been placed on its retired list. Starting in the yard of the Lynchburg Plant, January 1905, he afterwards worked in the pipe shop, the shipping department, and as janitor. Most recently he has served as messenger between plant and general offices. Son of Robert and Mary Austin who now live in Philadelphia, he resides at 515 Taylor Street, Lynchburg, and is the father of seven living children. Along with his pension check each month will go many good wishes from friends throughout the organization for full enjoyment of his harvest years.

Booker T. Frazier, Radford Plant

ed young men of higher intellectual abilities to industrial vocations.

The Negro, unfortunately, did not have such opportunity for conforming to the change-over from brawn to special skills. Young Negroes with intellectual ability found little incentive in the ranks of industrial workers. They therefore looked elsewhere for chance of betterment. This gave credence to the theory that Negoes were incapable of becoming skilled workers and trained technicians.

What of the future? Exigencies of war have brought the Negro into American industry in unprecedented numbers. Barriers against his entering skilled brackets are being eased. If his future is to be brighter than his past, he must meet the challenges and opportunities of this new situation with unflinching courage and determination. Personnel policies of employing, training, paying and promoting according to ability rather than color, will offer him a new and larger role as an industrial worker. He should be alert to qualify under management's adoption of such a system.

To match skill with skill today with the same degree of success as he matched brawn with brawn under the old order, the Negro must apply himself to clear-cut responsibilities. He should cultivate the mechanic's perspective of his job. He should develop an increasing appreciation of the moral as well as the physical qualities required. His leisure-time pursuits should be modified accordingly. He should study the trade-union movement and be prepared to react intelligently to its varied urges and demands. Thus can he prove himself a workman who needeth not be ashamed.

(The displacement of the brawn factor in industrial efficiency has great significance for the Negro worker. Progressive employers such as the Lynchburg Foundry Company may be counted on to keep in step with industrial trends now speeded up by war. Negro employees such as those of the Lynchburg Foundry Company may be counted on to merit the benefits afforded by these trends. New horizons are ahead for those who set their sails in the right directions.—Ed.)

A Negro Soldier Writes of His Heritage

"AFTER several months here of Army life, with one of the most important branches of the service—the Air Corps—I have observed a cordial relationship between the white and colored soldiers of this station (South Carolina). Everyone here realizes that this is a war—that this is the Army, not a classroom for 'ologies, hatreds and race problems. Everyone here realizes he has a job to do, and he is doing that job with credit to his country, to his commander, to his company and to himself.

"As a young American Negro in the uniform of my country I am happy, as many others are, to be among that marching throng of the armed forces who are doing their part to win the war—for the restoration of human decency—for the security of a lasting and just peace.

"To the American Negro I say he has as much to fight for as any other American. He has as much to be proud of as any other American. He has as much at stake in this conflict as any other American. If a foreign type of slavery is inflicted upon my country as a result of going down in defeat in this war, my own race, the American Negro, will not be an exception to the general pattern of inhuman treatment of the peoples conquered and dominated by Hitler and his association of mass murderers.

"America is my home. America is the place of my birth. America is where I worship a God of my own choice. America is a place where a man can raise a family and educate his children without government interference. America is still a place where a man can enter business, prosper, succeed and take his rightful place in life. America is still a place where a Joe Louis, a Marian Anderson, a George W. Carver, a Mordecai W. Johnson, a C. C. Spalding and numerous other American Negroes have won the respect of their fellow Americans—Americans of all races and colors."

—Bert Cumby, of Washington, D. C., graduate of Fisk University in a letter to the *Washington Post*.

Corporal Harrison McGill, U. S. Marine Corps, Formerly of the Company's Engineering Department

(Photo made for the Ironworker after his return from Guadalcanal)

Guadalcanal Story

MAJOR General Archer A. Vandegrift, commander of the Marine forces that fought so valiantly to clear the Japanese from Guadalcanal Island, visited Lynchburg shortly after his return to the United States and told its citizenry, in tribute assembled, a self-effacing but masterly drawn story of that great feat. Terming Lynchburg (his wife's home town) his "home by adoption," he thrilled listeners with his factual unadorned account of the stirring events that brought disaster so close but victory so complete.

Corporal Harrison McGill, following his Commander to Lynchburg some days later, personified to the townfolk the individual infantryman who made the Guadalcanal job possible. Surrounded by trophies of the campaign, he was visited and interviewed for the colorful eye-witness account he gave of details left out of broader panoramas. During his stay he greeted former associates in the Company's general offices and made a short talk to a group of shopmen.

Enlisting in the Marine Corps in 1940, from the Engineering Department of the Lynchburg Foundry Company, McGill covered the long road to the Solomon's by way of the customary Marine training at Parris Island, Boston, Quantico, San Diego and New River. In November 1942 he arrived on Guadalcanal. After the first night at Henderson Field, he was sent to the east of the island for twenty-two days of patrol duty. Fighting there began almost immediately and at its end only five of his squad of thirteen remained. That percentage of loss was about average, he commented.

Most of the fighting, according to McGill, was of the hand to hand variety with the enemy attacking principally at night. The Japs are crafty and fearless, he observed. "The only thing yellow about them is their skin." The jungle terrain, its tropical growth, its bird and animal life, its heat and constant rainfall contributed to the hazards of the fox-holes. Lack of food and drinking water was acute at times.

Corporal McGill took part in three big battles: Tenevu River, Red Beach and Bloody Knoll. When relieved, he went to Australia for a time before returning home. There the Marines, worn and tattered but happy to be back in civilization, were given a great reception. "I was wearing a pair of torn, stained khaki shorts, a steel helmet, shoes but no socks," he said. "And I hadn't shaved for a month. At that I was better dressed than some in the party."

Powell Harrison McGill, native of Lynchburg, attended its E. C. Glass High School and Randolph-Macon College at Ashland, and lived for a period prior to the death of his father, at Raleigh, N. C. His leave was spent at the home of his mother, Mrs. O. H. Smith, wife of the Company's Plow Sales Manager. He has since returned to Marine duty.

"The Navy regrets to inform you that your son, Ensign Ralph Gabriel Wingfield, was killed in performance of his duty and in the service of his country."

Ensign Ralph G. Wingfield

Ralph W. Wingfield, assistant sales manager of the plow department, on May 12 received from the Navy Department the above message. "Sonny" Wingfield, whose father's entire business life has been spent in the Lynchburg Foundry Company, was widely known and loved among its personnel who feel deeply his family's loss. Volunteering for war service shortly after receiving his bachelor of science degree from Notre Dame University, he received his wings and commission in September 1942.

Our Airmen Arrive

"You have often read in the magazines about 'the finest sight you ever saw' or 'the finest person you ever met.'

The finest sight I ever saw was one afternoon after we had been there about two weeks without any air support. I was standing on a hill and over the coconut trees, from the southeast, came two squadrons of U. S. fighters and two squadrons of dive bombers. I can assure you that to me and to the rest of the men on that island that was one of the finest sights any of us had ever seen."

—Maj. Gen. A. A. Vandegrift.

Charlie Staton (left) and Thomas Marshall (right), formerly of the Radford Plant, with a Navy buddy, Ayndill Wickline

Offense And Absence

(Offense: act of attacking. Absence: state of being absent.—Webster.)

By A. E. Fuller

(Al Fuller, storekeeper at the Lynchburg Plant, is a busy man these days, like everybody else who is doing his war job well. Still he finds time for extra chores such as this one in the cause of better production. A consistent contributor to the magazine throughout his twenty years with the Company, he practices all he preaches in the unmincing words of his text.—Ed.)

Leon Harrell, formerly of the Lynchburg Special Foundry

AFTER months of preparation United States forces at last are fighting an offensive war. Having to remain on the defensive so long after the attack at Pearl Harbor taxed American patience sorely. An outraged nation wanted to strike back at once with all the force of its fury. But it did not have the necessary weapons. Until these weapons were ready only defensive action could be undertaken.

The period of training and conversion has now been completed and the steady flow of men and materials necessary to offense is being provided. Allies revitalized by the "Arsenal of Democracy," and our own intensively trained fighters pound the enemy on various fronts. That our preparation was accomplished so thoroughly in so short a time has upset Axis calculations. Vengeance and victory are taking shape.

Production Is Paramount

We workers on the home front have helped make all this possible. It is necessary now that we too have the spirit of offense. Our part in keeping production at its high level is paramount in the maintenance of offensive war. It must continue unabated to insure ultimate victory.

Will we workers in vital war production meet this challenge? Unless we do we fail our country and ourselves. Once an offense starts any slackening of the pace means enemy advantage.

A Word for It

Great concern continues over loss in war production because of absences. "Laying off," it used to be called in labor language. AWOL is the Army term for the same thing. *Absenteeism* is the big word for it these days. By any name it's bad business in war time.

When employees for only trivial excuse fail to report to work, they are putting self above services. In war this attitude cannot be permitted. What sort of army would we have if soldiers served that way? Can we give less than we ask of them?

Letting Us Down

We are not backing up our boys out there when we hold a careless view of our jobs back here. An indifferent war worker without sense of responsibility is not worthy of the great name American industry has won in this war. He is letting us down.

One absentee thinking only of the indisposition or the inconvenience at hand is, to be sure, a small consideration in the great over-all production mass. But that absentee counted over and over again in shop after shop adds up to staggering totals of lost man-power. This dent in the production line makes its corresponding dent in the fighting line.

Cheating at the Game

The planes, tanks, guns and ships that this army of absentees could have turned out may be counted lost by enemy action just as truly as a like number actually destroyed in combat. Workmen who deliberately fail to report for duty without proper cause are prolonging this war and cheating at a game of life or death.

Our boys in filthy fox-holes and on blistering deserts, strafed night and day by enemy fire, have no time off from their fifty-dollar-a-month jobs. How can we, making more than we ever earned before in our lives, justify ourselves in doing less than they of what is asked of us?

No Time Out

There is no time out for soldiers sickened by the stench of the battlefield. There is no time out for sailors battered by death-struggles at sea. Why should there be time out for workers safe and comfortable at home? We are proud of what our fighters are doing. Are we proud of what we are doing?

The offensive war we wanted is underway. We workers in war production are a part of its time-table. Let us not forget that absence slows offense.

As a popular poster puts it: you can't spell vicTory with an absent T.

WOMEN EMPLOYED AT RADFORD PLANT

Left to right, front row: Miss Josephine Hornbarger, Miss Lucy Towe, Miss Eloise Hurt, Miss Muriel Hegwood, Mrs. Dootsie Robertson, Miss Edith Spencer, Miss Ruth Stump, Miss Virginia Galaway, Mrs. Dewey Woods, Mrs. George Linkous, Mrs. C. S. Quesenberry, Mrs. Pauline Moore, Miss Marion Graham

Left to right, back row: Mrs. Louise Morris, Miss Lois Farmer, Miss Viola Shelor, Mrs. Evelyn Agee Smith, Mrs. Kathryn Howell, Mrs. Elsa Buchanan, Mrs. Robert Austin, Mrs. Eunice Phillips, Mrs. Phalia Kinder, Mrs. Ernestine Clements, Miss Virginia Nye, Miss Elizabeth Williams

A New Service at Radford

Mrs. Buchanan Assists Robert Kirtner in Making Application for Automobile Tires

These days of new laws and wartime requirements find workers in industry often hard pressed for time and information necessary to fulfillment of government regulations. A service designed to relieve many such difficulties for plant employees has been inaugurated by the Radford Personnel Department. Mrs. Elsa Buchanan now assists Company applicants in completing the forms covering selective service, gasoline, and tire rationing, income tax and other regulated matters. After morning classes in her studies at Radford State Teachers College, Mrs. Buchanan is available for this purpose each afternoon at her desk in the street office. By keeping in close touch with the various local administrative boards, she is in a position to make ready adjustment of cases that otherwise might take up much time and effort.

Prisoner of War

"Happy" Hoover, popular long-time supervisor at the Radford Plant, has been notified by the War Department that his son, Private Guy W. Hoover is being held a prisoner of war by the Italian government. A month previously official notification had come that he had been missing in the North African area since February 20. At that time it was said that he was on a scouting detail when last accounted for. "Jack" Hoover, as known to Company friends, was at one time employed at the Radford plant. Needless to say, all shared with Mr. and Mrs. Hoover in the relief brought by the second message, and cherish with them the hope that still better news of Jack may soon be forthcoming.

Accepts New Position

Macon P. Miller, with the Company since January 1, 1930, and works manager of the Radford Plant since February 1, 1938, has resigned to become personnel director of the Whiting Corporation at Harvey, Illinois. He assumed his new duties June first and R. S. Dower, assistant works manager has succeeded him in the Radford organization. Mr. Miller goes with the good wishes of many friends made in the course of his widely ranging business and civic activities. Fitted both by personality and experience for his chosen work, he takes to it distinctive qualifications for success.

Mrs. Gemmill Appointed Radford Nurse

Mrs. T. S. Gemmill, wife of Dr. T. S. Gemmill formerly Company physician, now Lieutenant Commander in the naval medical service, has been appointed full-time nurse at the Radford Plant. Her duties will include preventive care, consultations, dressings, and first-aid.

To My Fellow Workers:

Seven weeks ago my only son was killed in the war.

Most of you know this but you can't possibly know how Hardy's mother and I feel.

That is, none of you except Walt Gardner who just lost his boy too.

Since Hardy's death I've been doing a lot of thinking. What I'm trying to figure out is why so many of us are taking things for granted and not doing all we can to help win the war.

Maybe it's because we keep hearing and talking about the war lasting for years. That sort of thinking might keep anyone from hurrying.

It could be that this long-pull stuff was why we lost almost half a million minutes of production time last month through absences and tardiness.

Anyway I'm fed up with all this talk about a 5 or 10 year war. There's no sense to it. We can win this war quick. We've got to.

If we don't your boys will be killed like mine was.

Please, please don't wait for the casualty lists to come rolling on. Throw yourselves into high — NOW.

Get going as though both the Huns and the Japs had to be licked in 1943. Maybe they will be if we really try.

I suggest a new slogan for Carrier. Here it is —

"LET'S GET IT OVER QUICK!"

I hope you won't think I'm preaching. I'm not. I'm praying.

Yours truly,
Arthur Hocking*
Clock No. 2062

*An employee of Carrier Corp., Syracuse, N. Y.

To You—Dad Hocking—We sincerely hope and pray that every person who reads your plea will throw it in high NOW to get this damned war over QUICK—and we hope millions will read it.

To editors of other publications—THE LOUIS ALLIS CO., Milwaukee, will send an electrotype of this page to you gratis—so you can reprint this Dad's plea in your publication.

Official U. S. Navy Photograph

TO SPEED VICTORY

BUY UNITED STATES

SAVINGS BONDS

AND STAMPS

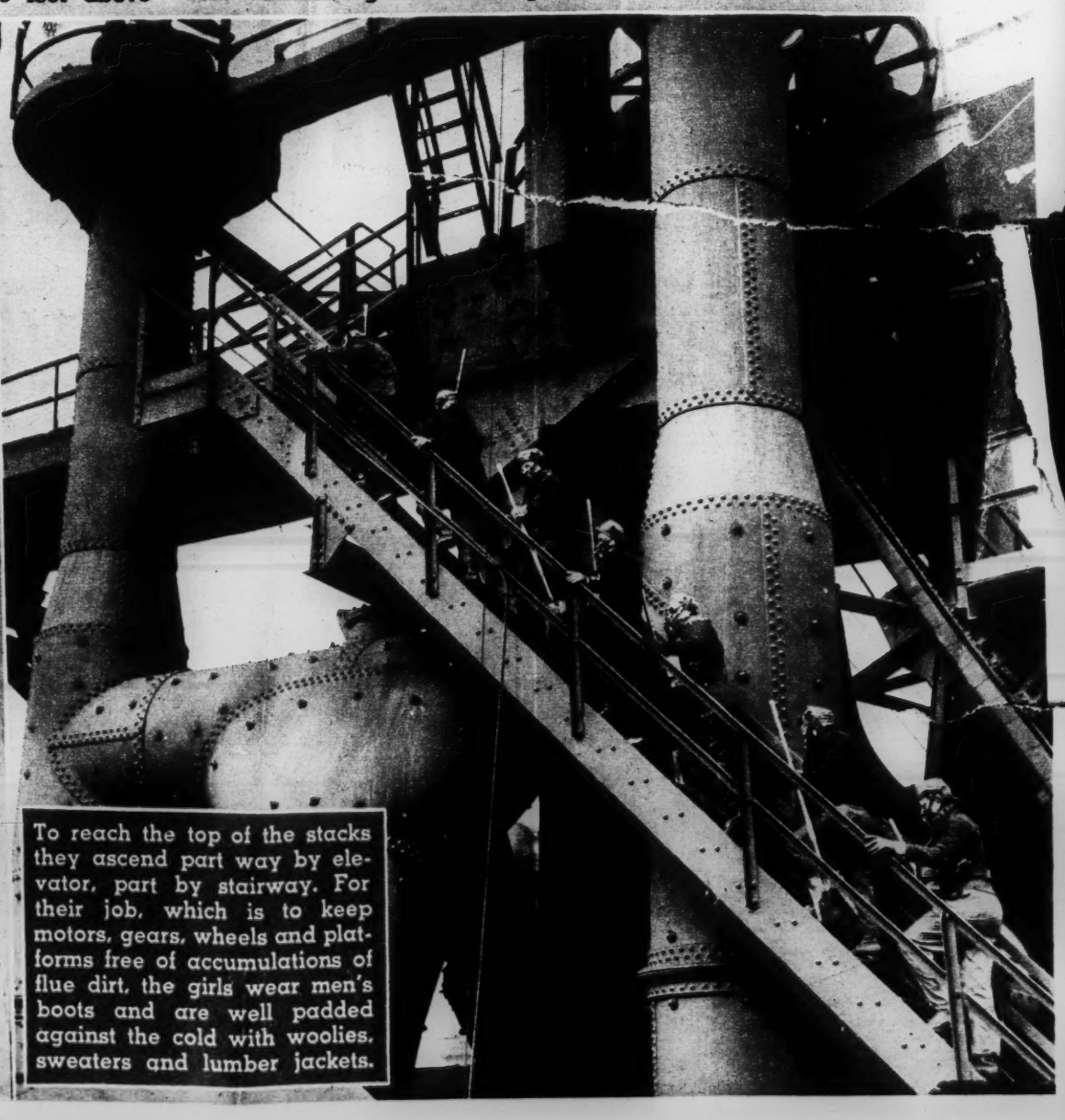
OCCUPATIONS

Metal Trades - 1944

LADIES OF THE BLAST FURNACES

One of the most unusual jobs undertaken by women these war days is held by the crew which cleans around the big stacks of the blast furnaces at Carnegie-Illinois Steel Corp., Gary Works, U.S. Steel subsidiary. Beginning at 7 a.m., the gang meets in the office with the foreman, Jerome G. Sebo, to receive instructions for the day and to test the gas mask apparatus which must be worn near the "high top" (185 feet above ground) where there is a high percentage of carbon monoxide in the fumes. Reading clockwise—Dolores Macias, 1338 Adams st.; Josephine Pulido, 1440 Adams st.; Sebo, 1946 Connecticut st.; Mary Papp, 844 E. 36th pl.; Bernice Daunora, 3817 Massachusetts st.—Gary; Helen Gloff, McCool, Ind.; Dorothy Cambern, 1160 Durbin st., Gary; Versa Johnson, 2829 Vandenberg st., East Gary.

Josephine leads the girls as they file out of the office to pick up their shovels. Selected for their physical fitness, they are given periodical health checkups and are carefully trained in safety precautions.



To reach the top of the stacks they ascend part way by elevator, part by stairway. For their job, which is to keep motors, gears, wheels and platforms free of accumulations of flue dirt, the girls wear men's boots and are well padded against the cold with woolies, sweaters and lumber jackets.

She holds hands with him, but she means business. A little pressure applied in a skilled manner and the big fellow faces a hospital bill for broken bones. Edward Carter, the stout fellow, is really a gentleman and a student of the art of jiu-jitsu. He let Paddy Walker, dancer, try these holds at the Jiu-Jitsu Institute, 188 W. Randolph St.

This hold will work on anybody, Paddy proves to the satisfaction of Jean Gahan, sister member of the Chicago Theater Ballet. Dancing girls, jiu-jitsu experts say, make apt pupils in the art of self-defense because they have learned muscle co-ordination, grace and the rule of keeping in good condition.

This looks like a pretty girl in distress. However, with a little knowledge and a cool head she may be able to extricate herself. In 1,100 tests made by Harry Auspitz, president of the Jiu-Jitsu Institute, he found that "the victim in a holdup at close quarters has a decided advantage over the gunman." Watch Rosemary Madden, College Inn model, do her stuff. The man is Rodney Sparr, also a pupil.

(Photos by Emmet Barden.)

Her left hand swings downward, knocking the gun aside. She aims a solid blow at the man's solar plexus simultaneously with the right hand. The gun flies aside. In 21 per cent of the tests the gun flew out of the hand of the holder. In 65 percent, the hand was numbed. The gun was always knocked aside before the trigger could be pulled. It takes about one second for Rosemary to complete her work and almost two seconds for the gunman to respond to her first move. Notice how the gun is going off harmlessly to the girl's left. The cover picture shows how Rosemary's right hand has her opponent in distress. Don't try this unless you know what you're doing.

They pitch in, scraping and shoveling the bits of coke, slate and ore spewed out from the pig iron furnaces. The amount of oxygen in their gas protection equipment limits them to an hour and 15 minutes at a stretch on the higher platforms. Before it is exhausted they descend to the lower levels, where there aren't any gasses, to continue cleaning.

In the toolroom the girls take off some of their heavy gear, eat lunch, and compare notes on their home duties. All run households, wash and cook. Lunch period is a half hour, with 15-minute rest periods twice a day.

Vigorous scrubbing is necessary at quitting time (3:20 p.m.). Several of them have now been blast furnace workers for a year. All say they like their jobs and are proud to be considered as efficient as the men they've replaced.

(Photos by Joseph L. Zack)

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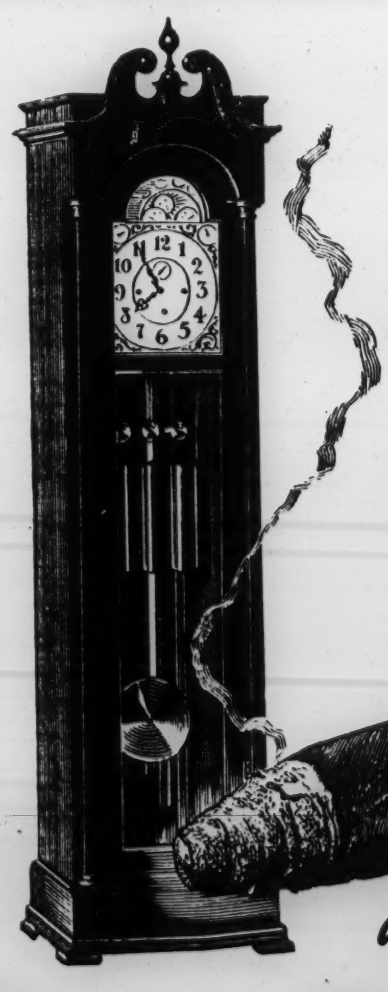

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MEC-GRAVURE—CHICAGO

Women in Iron Works Prefer Jobs That Back Front Lines

By Genevieve Reynolds

Contrary to popular belief, Washington isn't all diplomats, stenographers, bureaucrats and generals. Approximately 20,000 women here toil in nonwhite collar jobs. Of this number, 8800 are producing war materials in 13 manufacturing establishmets. Two thousand seven hundred and fifty-three women work with lathes, drills, welding implements and other tools at the Navy Yard.

All together there are some 4000 women ordnance workers in various Government-run war plants. These women wear overalls or slacks and sling hammers, chisels with the same skill as men coworkers.

A check of the commercial iron works in town now turning out bomb racks, 40-mm. shell clips, etc., reveals only one concern employing women. At the Gichner Iron Works at 1214 24th st. nw., you will find 20 women cutting iron, scraping away the rough edges from welded pieces of flare holders. Since the Spanish-American War in 1896 the company has made war materials for the front battle lines. But in no other war has it employed women. Since turning from fine grill and iron works to all-out war production the company has received an E award and two stars for excellency and efficiency.

A prominent, elderly Chevy Chase woman, who until a few months ago was mainly occupied with her thoroughbred horses, is now putting in full time at the Gichner Iron Works. With two sons in the service this intelligent Mrs. Zelpha Cummings chocked her social activities and pitched in to help win the war.

"I feel everybody should do something," she explains. "Always I had a hankering to try something mechanical. Here I am and quite happy about it."

Patriotism Is Prime Motive

Mr. and Mrs. Maxie Phillips just had to get in front line production. So they left their home in Goodson County, Va. They work side by side. Two sons-in-law were the inspiration for their decisions.

Until the war Mrs. Phillips was just a housewife. About 40, blue eyed, of medium height she remarks, "Sometime it's hard. Somehow, you stay when you begin thinking it's a priviledge to do something. Also, it makes you feel important when you're not sitting down letting someone lese do your part."

"I think of my brothers more than anybody else," says blonde, blue eyed Blanche Goureley, as she continues chipping part of an ammunition rack. "I keep thinking maybe this will help them get out of the Army alive."

It was her cousin, Mrs. Phillips, who persuaded Miss Gourley to give up her job in a rayon mill to take the defense job.

Ebony-haired, black-eyed, Tina Zito, who gave up her job in a cigar factory in Greensboro, N. C., continued to cut iron sheets as she looked up long enough to remark, "I hope this thing I am working on will knock the Japs to hell."

Josephine Griffith, who has been in the iron works about six months, lisped, "I gotta do more than pick apples. I can't let my brudder down. He's overseas and he's gotta have sompen' to fight dem Germans with."

She Hates Japs

Before the war, plump, smiling Mrs. Florence Cuddeford operated a 160-acre cattle and dairy ranch in Oregon. Then she came East and worked as a mechanic for the Arlington Bus Co. That wasn't close enough to the war effort. Now she feels much happier turning out war implements that go directly into battle.

"When the job gets unusually tough I sometimes mutter, 'I wish I had those blankety blank Japs here,'" she declares, as she vigorously scraped part of a flare rack. "I'd like to make them do this work at the point of a gun."

Then Mrs. Cuddeford looked up and smiled pleasantly, "I imagine some American boy picking up the finished product," she asserts. "It's just a job to be done—so hurry up and get it over with."

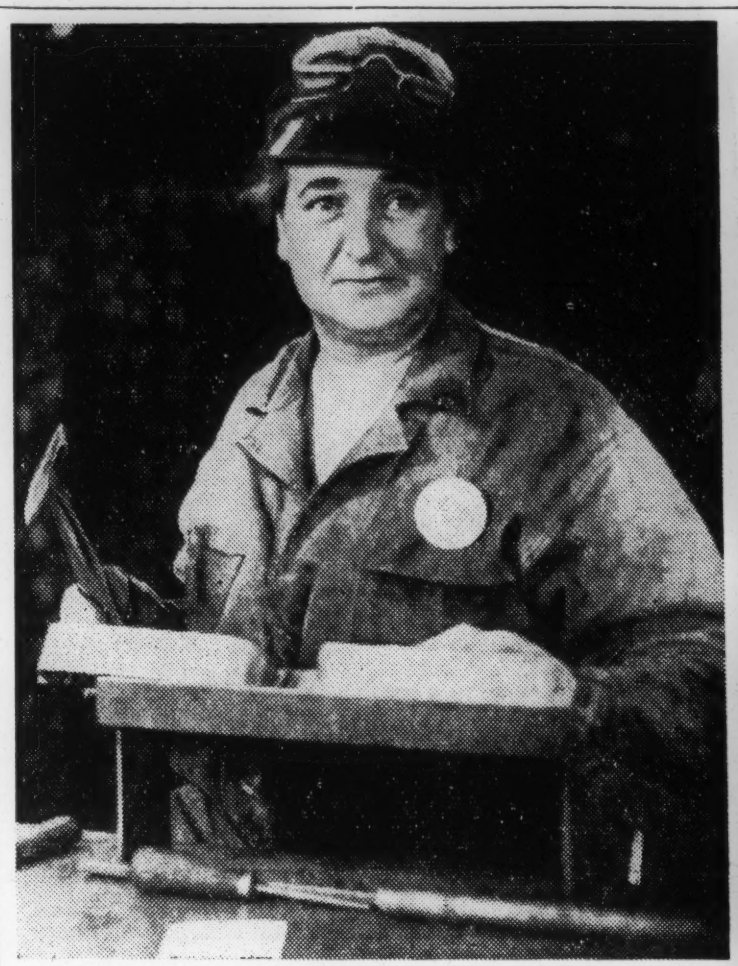
Hilda Jones, who hails from Dennis Station, started at the iron works when her husband was called into the service. Mrs. Florence Pacheli is another who jumped into war production when her husband went into the Army.

Brawn Does It

Eighteen of the women interviewed on their jobs gave patriotic motives as their reason for being in a glamourless, noisy shop. All except three had brothers or husbands in the service. Each is vying for an extra war bond that the company gives each month for those who don't miss a day.

In addition to women who produce war materials with their brawn and energy, you will find thousands of others holding down laborer's jobs. For example, there are 4737 in restaurant work, 909 employed by the Capital Transit Co. as streetcar motormen, conductors, mechanics.

No, all the Nation's Capital's workers aren't in the white collar category. Drills, welding machines can be heard above the click click of thousands of typewriters.



Photos by Henry G

NO BACK LINE DEFENSE for Mrs. Florence Cuddeford. She gave up a 160-acre cattle and dairy ranch in Oregon to hammer out war implements at local iron works. A versatile mechanic, she prefers making flare racks to wiping windshields. At right are seen Mr. and Mrs. Maxie Phillips of Goodson County, Va. Husband and wife chucked farming for a closer feeling to the war. The couple get great satisfaction working on ammunition that goes directly to the battlefields

Miss Loftus And Mr. Nixon Repeat Vows

The marriage of Miss Theresa Kathleen Loftus, daughter of Mr and Mrs. Peter J. Loftus, to Raphael I. Nixon of Spokane, Wash., took place at 10:30 a. m. yesterday at the Shrine of the Sacred Heart. The ceremony was performed by the Right Rev. Mgsr. James A Smyth.

The bride, who was escorted to the altar by her brother, Austin J Loftus, wore a wedding gown o white shadow mousseline de soi fashioned with a sweetheart neck line, the ruffled skirt ending in flowing train. Her veil was held i place by a cap of lace which w trimmed on either side with oran blossoms. She carried a pea prayer book from which fell shower of lilies of the valley.

Theodore G. Kirschner of N York City was best man.

The bride had for her matron honor her sister, Mrs. Raym

Harris & Ewing

BETROTHED TO MAJOR is Evelyn Clower Green, daughter of Lieut. Col. and Mrs. Berryman Green 3d, who make known her engagement to Alfred Garey Lambert, jr., USAAF, son of Mr. and Mrs. Alfred Garey Lambert of Alexandria, formerly of Richmond, Va. Miss Green attended Mary Washington College. Maj. Lambert was a member of the class of 1938 at Virginia Military Institute, has been in combat duty with the Eighth Air Force in England for 14 months

Elizabeth Carr Will Marry in Fall

Leesburg, Va., July 15.—Mrs. Josephus Carr of Leesburg announces the engagement of her daughter, Elizabeth, to R. K. McClintock of Buffalo, N. Y., son of Mr. and Mrs. John McClintock of Emporium, Pa. The wedding will take place this fall.

Miss Carr is a graduate of William and Mary College and is now connected with the Department of Commerce.

Dr. Ramon, Ecuadorian, Country's Guest

Dr. Gonzalo Ramon, director of the technical department of the Ministry of Finance of Ecuador, has arrived in Washington as guest of the State Department to spend about six months studying the tax system of the United States. Dr. Ramon is also chief tax auditor of the Ecuadorian Republic.

Although this is Dr. Ramon's first visit to this country his English is fluent, a fact at least partly due to his long association with North American and British firms doing business in Ecuador.

"We did not know much about the United States before the war," he says, "nor did you know much about us. A real understanding and a real friendship between our people is resulting from travel back and forth of engineers, physicians, professional men and women in all branches, and from study and investigation carried on in both our countries by citizens of both. I believe that Ecuador is benefiting greatly from this, and that the United States is benefiting likewise. It is to the advantage of both for such ties to increase and strengthen."

Dr. Ramon speaks with enthusiasm of the work being carried out by the Ecuadorian-United States cultural institute at Quito, the national capital, in teaching English; and of the great interest in learning Spanish that, as he says, "is to be seen in Washington, at every hand."

Club Plans Events

Continuing their summer activities, the Business and Professional Women's Club has planned three events for the coming week.

Tomorow there will be swimming at the Marjorie Webster Junior College pool at 8 p. m.

Come Tuesday and the Red Cross surgical dressing unit will meet at Walsh House at 7:30 p. m. with Miss Vera Lundquist acting as chairman.

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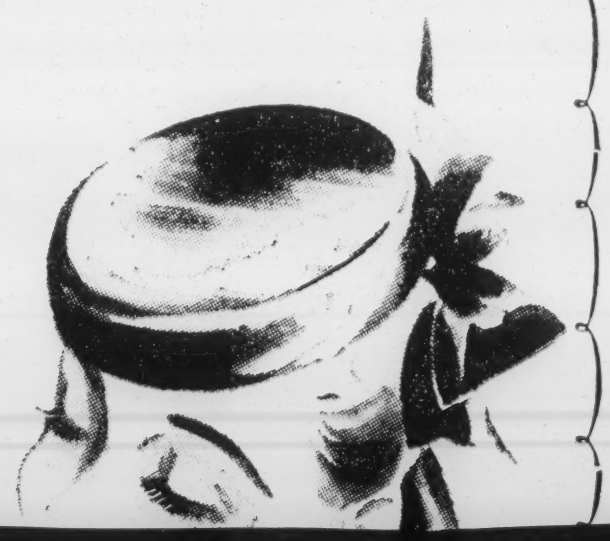

Bloch-73955 Women - steel WPB-5222 RSN MVR EE

WAR PRODUCTION BOARD

For Immediate Release
Thursday, March 16, 1944

Cleared and Issued
Through Facilities of the
Office of War Information

Members of the steel industry were told by government officials at the Steel Industry Advisory Committee meeting that they will have to face severe manpower losses because of the inroads of selective service requirements in the next few months, the War Production Board revealed today.

Stepped-up demands of the armed services were presented to a large group of steel men from all sections of the industry by Major General Lewis B. Hershey, Director of Selective Service. General Hershey stressed the need for young men, particularly those between 18 and 26. He expressed sympathy with the plight of industry and the fact that, because of military demands for men, the steel industry may fail to meet the production quotas set for it by WPB, but he said that steel producers should not be dismayed by prospects of failure.

"My job is to provide men for the armed forces," General Hershey said.

Donald M. Nelson, chairman of WPB, told the steel industry representatives that they, along with all others, undoubtedly face one of the most difficult periods of the war. He said that the Army and Navy need men, and that they must get the men, even if it means losing production. But he expressed confidence in the ability of industry to produce all the goods needed despite manpower losses. He said:

"American industry has never been licked - it won't be licked now."

Many members present expressed fear over the consequences of losing additional men. Reports were submitted by industry revealing that production is already falling off due to labor shortages and, with the arrival of warm weather, these shortages are expected to grow more serious.

One firm reported an anticipated shortage of 11,000 workers although already employing 15,000 women. In this plant thousands of men are working 16-hour shifts seven days a week, obviously a condition which can't keep up much longer.

Industry members indicated that there are now 42,000 fewer men working in steel plants than two months ago, and the decline is accelerating.

In order to conserve manpower after the heavy inductions of the next few months, committees may be set up on local levels to work with industry toward surveying the needs of each plant and making recommendations to local draft boards for those deferments that are absolutely essential to the continued operation. The committees would be made up of representatives of the Army, Navy, Maritime Commission, War Manpower Commission and WPB.

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WAR MANPOWER COMMISSION

WASHINGTON, D. C.

FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS

APPRENTICE—TRAINING SERVICE

May 11, 1944

Miss Mary Anderson
Director, Women's Bureau
U. S. Department of Labor
Washington, D. C.

Dear Miss Anderson:

You may find of interest the attached re-print of the article which appeared in a March issue of a steel magazine, "Women at Work, Speed Production at Wyckoff Drawn Steel Co.".

A limited supply of additional copies is available upon request.

Very truly yours,

Wm F. Patterson

Wm. F. Patterson, Director
Apprentice Training Service

3351

Attachment:

"Women at Work, Speed Production at Wyckoff Drawn Steel Co.".

WOMEN AT WORK

SPEED PRODUCTION AT WYCKOFF DRAWN STEEL CO.

By Mary Curran
Apprentice-Training Service, Bureau of Training
War Manpower Commission

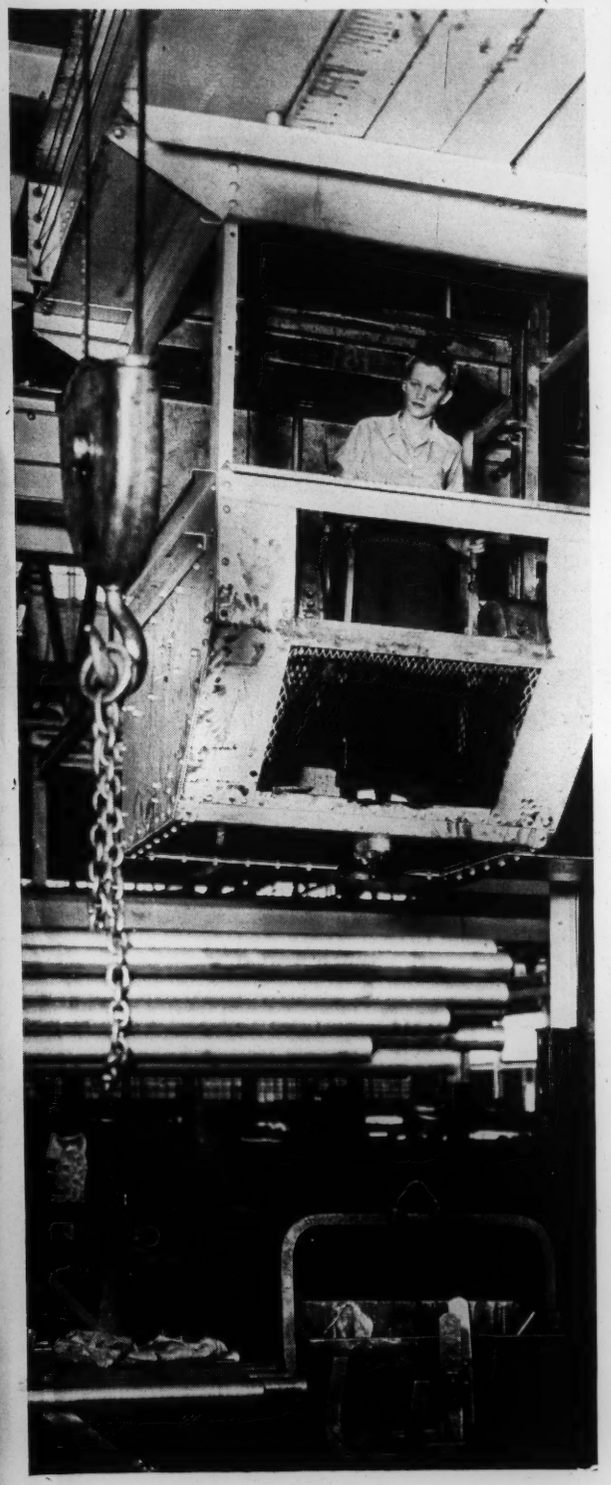
8

This is a description of how a cold drawn steel mill met its manning problems through the introduction and training of women and other draft exempt workers. Production has resulted in the addition of a 4th star to the Army-Navy "E" flag.

Reprinted from STEEL, *March 20, 1944*

Speed Production at Wyckoff Drawn S

Twenty-five per cent of expanded force constituted by women trained since war started. One hundred and fifty-three jobs in cold-drawn steel plant can be filled by female workers. Forethought in planning and training regarded as key to success of the program



By MARY CURRAN
War Manpower Commission

HOW the Wyckoff Drawn Steel Co., Ambridge, Pa., is meeting its replacement problem by utilizing women workers is a story of interest to every employer in the metalworking industry. Today, Wyckoff employs a larger percentage of women workers than does any other cold-drawn steel mill, according to Vice President J. G. Schaefer. Women constitute more than 25 per cent of the total expanded force. Wyckoff officials attribute their production achievement throughout the replacement and expansion period to their plan for the utilization and training of women and other draft exempt workers.

In the fall of 1942, it became apparent there were not sufficient men in the Pittsburgh area to satisfy the requirements of the armed forces and the expanding war production establishments up and down the Ohio valley. The production force at Wyckoff, as in other cold-drawn steel mills, always has been exclusively male. When consideration was first given to the possibility of employing women to handle some of the jobs, company officials recognized a need for special consideration of the problem and some advisory assistance on it. They had no experience in employing women in mill jobs, nor had their foremen and other male workers experience in training and working with women.

Recalling service provided the company earlier on apprentice training, in-plant training technicians from the Pittsburgh office of the Apprentice-Training Service were requested to survey the jobs in the plant and advise on those in which women could be employed, and the training time needed to bring them to job proficiency. A representative of the Women's Division of the Pennsylvania State Department of Labor and Industry assisted in the survey, providing helpful information on safety and health standards and state regulations in connection with the employment of women workers.

Form Six-Member Committee

Most the jobs to be surveyed were in the line of progression along which the men moved as vacancies occurred, according to the existing bargaining agreement. Therefore, before making the survey, the training technicians of the Apprentice-Training Service discussed in detail the reason and necessity for such a study with the residence ordnance inspector, and the district representative and local president of the United Steelworkers, the bargaining agency for the plant. To work out a solution to the problem of placing women in the jobs listed as a result of the survey, a committee of six members was formed with

One of the first jobs to be filled by women at Wyckoff Drawn Steel Co. was that of crane operator. At left is shown a woman operator with a load of steel bars. Below, a team inspects gun barrels. At right below, women workers are operating centerless grinders

Steel Co.

the vice president, personnel director, and plant superintendent representing the company, and the president, secretary, and a member of the shop committee representing the union. This committee, agreeing upon the necessity for employing women in the mill, recommended three supplementary provisions to the regular bargaining agreement to make this possible. The provisions are as follows:

A. The agreed-upon schedules of pay currently in effect shall apply to women as to men; as shall the 1942 agreement, except as herein modified.

B. When a man is displaced from a job by a woman he shall be paid for the work to which he has been displaced at the rate of the work from which he is displaced excepting if the rate of the new job is higher, then he shall be paid the higher of the two rates.

Permit Circumvention of Jobs

C. A woman shall be permitted to circumvent such jobs in line of progression which she is physically unable to do in order to progress to job she is able to do; and a man shall be permitted to circumvent women's jobs in the same manner.

This supplement was agreed upon by the company and the union. Company officials state that the joint committee, originally formed to consider the problem of introducing women to the mill, has continued to advise on utilization and training, removing many difficulties and smoothing the way for successful operation of the plan.

Further preparation was made for receiving women workers in the plant by setting aside sufficient space for individual lockers and complete washroom facilities, including showers. Adjoining these facilities, a first-aid room was equipped and a full-time attendant employed. This compact arrangement has made it easy for the women to get immediate first-aid treatment when injured in the plant.

Thus, the procedure for introducing women workers was fully worked out before any women were hired. Planning ahead has paid dividends in avoiding controversies and eliminating misunderstandings in regard to the employment of women. Company officials credit the rather remarkable success in operating this agreement to the co-operation of Wyckoff men and their recognition of their patriotic duty in doing all they can to keep production moving through acceptance of any necessary job adjustments.

Women Operate Cranes

One of the first jobs to be moved from the line of progression for the duration of the war was that of crane operator. This is one of the high-wage classification jobs but one which could be satisfactorily performed by women. The cranes in this mill can be operated without much physical exertion and are easily entered by an attached ladder. The first women placed in these jobs were carefully selected.

Each crane operator trainee works with an experienced operator for 30 days before being allowed to operate alone. The women have worked out splendidly in this job and now all of the main mill cranes on all three shifts are operated by women. Although the women selected for crane operation are usually between the ages of 21 and 35, final selection is on personal qualities. One of the best operators is over 40.

The original survey made in the fall of 1942 by the Apprentice-Training Service technician listed 153 jobs on three shifts as those in which women could be employed. This has proven a remarkably accurate estimate as there are now 150 women on the three shifts in the jobs listed.

Job classifications in which women are employed are: Time checker; assistant chemist; chemistry laboratory helper; emery testing machine operator; miscellaneous tester; chemistry laboratory clerk; lathe hands-test pieces; machine shop-drill press hands and grinders; crane operators; power hack saw for test pieces; centerless grinders; power hack saw, production work; punch press, straightening (keep one man per shift); inspectors; checkers; magnetic tester; turning machines; shape straighteners, improve handling methods; receiving clerk; crane, pointing department; pointing machines; wiring shapes for pickling; turning test pieces, die room and machine shop; surface grinders; mill office clerks; mill office weighman; medart straightener, small; shears; and as stockers.

Responsibility for worker training is under the direction of a full-time training supervisor. In carrying out this assignment, he works in close co-operation with the plant superintendent. An induction conference is first held with all new employes by the personnel director, who then introduces them to the training supervisor. The training supervisor then turns the workers over to the care of the proper job instructor to receive training in job proficiency on production work. The average training time varies according to job from one week to one month. Foremen and job instructor have had the benefit of job instructor training and job methods training offered by the Training-Within-Industry Service of the War Manpower Commission. Supervisory training is given to foremen and supervisors through advanced courses at Pennsylvania State College.

Precision Important Factor

Fifteen women have been trained as magnetic testers, a job in which precision is an important factor. The company reports that they are performing very successfully on this job. Most of the work is done without lifting as the bars are rolled from one position to another. Although the bars are greasy and dirty the women accept this as part of the job, using the protective hand cream provided by the company. As aptitudes are observed women are trained for the more exacting jobs. It is now planned to select one of the girls showing aptitude on machine work and possessing the necessary physical qualities for the job for up-grading training to draw bench operator.

One of the women selected from the plant production force is now being trained as an assistant chemist in the laboratory. The laboratory technician under whom she is being trained says she is doing excellent work. In this laboratory, where samples are analyzed and tested, 120 tests a day are often required.

Forethought in planning the utilization and training of women workers has been the keynote to the successful manner in which Wyckoff is meeting its war production responsibilities. As Mr. Schaefer remarked, "If we hadn't put women in, we wouldn't now be breaking records on production."

REGIONAL OFFICES

APPRENTICE-TRAINING SERVICE
WAR MANPOWER COMMISSION

For information regarding the services of field representatives of the Apprentice-Training Service in the establishment of apprenticeship systems and other types of in-plant training programs, communicate with the representative at the nearest regional office listed below:

REGION I

(Conn., Mass., Maine, N. H., Vt., R. I.)
Joseph E. Johnson, *Acting Supervisor*
Room 744, 55 Tremont St.
Boston 8, Massachusetts

REGION II

(New York State)
John M. Marion, *Supervisor*
Room 617, Old New York State Bldg.
New York, New York

REGION III

(Del., N. J., Pa.)
Glenn H. Feller, *Supervisor*
Room 925, Stephen Girard Bldg.
Philadelphia 7, Pennsylvania

REGION IV

(D. C., Md., N. C., Va., W. Va.)
Robert F. Handley, *Supervisor*
Room 207, 433 Third St., NW
Washington 25, D. C.

REGION V

(Ky., Mich., Ohio)
John E. Morley, *Supervisor*
Room 674, Union Commerce Bldg.
Cleveland, Ohio

REGION VI

(Ill., Ind., Wis.)
Cecil L. Utterback, *Supervisor*
222 W. Adams Street
Chicago 6, Illinois

REGION VII

(Ala., Fla., Ga., Miss., S. C., Tenn.)
James M. Parmelee, *Supervisor*
Room 622, Grand Theatre Bldg.
Atlanta, Georgia

REGION VIII

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Room 500, Midland Bank Bldg.
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REGION XI

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Edw. E. Goshen, *Supervisor*
Room 614, Security Life Bldg.
Denver 2, Colorado

REGION XII

(Ariz., Calif., Nev., Oreg., Wash.)
Broncel R. Mathis, *Supervisor*
Room 701, Western Furniture Exchange
and Merchandise Mart
San Francisco 3, California

PUBLICATIONS AVAILABLE

Copies of any of the following pamphlets and reprints may be obtained by writing to Apprentice-Training Service, Bureau of Training, War Manpower Commission, Washington, D. C.

TRAINING TEAMWORK—Describes how management and labor have worked together in joint in-plant training committees in developing and putting into operation apprenticeship as well as short-term training programs; as exemplified in plants in four different industries.

THE WARTIME PROGRAM OF THE APPRENTICE-TRAINING SERVICE—Describes how this agency has assisted industry in establishing both short-term and apprenticeship programs; reprinted from "Personnel."

TRAINING WOMEN FOR WAR WORK—Outlines 10 steps in planning over-all training programs.

TRAINING WOMEN WORKERS—3-plant study of short-term training systems.

TRAINING APPRENTICES FOR WAR AND POST WAR WORK—Review of apprenticeship system of Murray Corporation of America, Detroit, Mich.

THE NATIONAL APPRENTICESHIP PROGRAM—Review of development of apprenticeship in this country and how apprenticeship systems are established.

APPRENTICESHIP PROGRAM OF CHICAGO PATTERN MAKERS' JOINT APPRENTICESHIP COMMITTEE—Detailed review of activities of committee.

TRAINING PROBLEMS IN WAR PRODUCTION PLANTS AND HOW THEY WERE OVERCOME—A 6-plant study.

SIMPLIFIED TRAINING SPEEDS SHELL PRODUCTION — Short-term training at shell-production plant of Holfast Rubber Company, Atlanta, Georgia; reprinted from "American Machinist."

SKAGIT STEEL AND IRON WORKS TRAINS MEN—Sedro-Wooley, Washington—Study of apprenticeship program for work as machinists, pattern makers, molders and coremakers; and short-term training system for semi-skilled work.

APPRENTICE TRAINING—ANSWER TO THE MANPOWER SHORTAGE PROBLEM—Describes how a large company employing a force of all-round skilled workers has kept pace with its manpower needs; reprinted from "Bus Transportation."

ST. LOUIS, MISSOURI AND VICINITY MACHINIST APPRENTICESHIP STANDARDS — Apprenticeship provisions, apprenticeship agreement, record forms, official endorsements, etc.

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METAL TRADES - 1945

REPRODUCED AT THE NATIONAL ARCHIVES

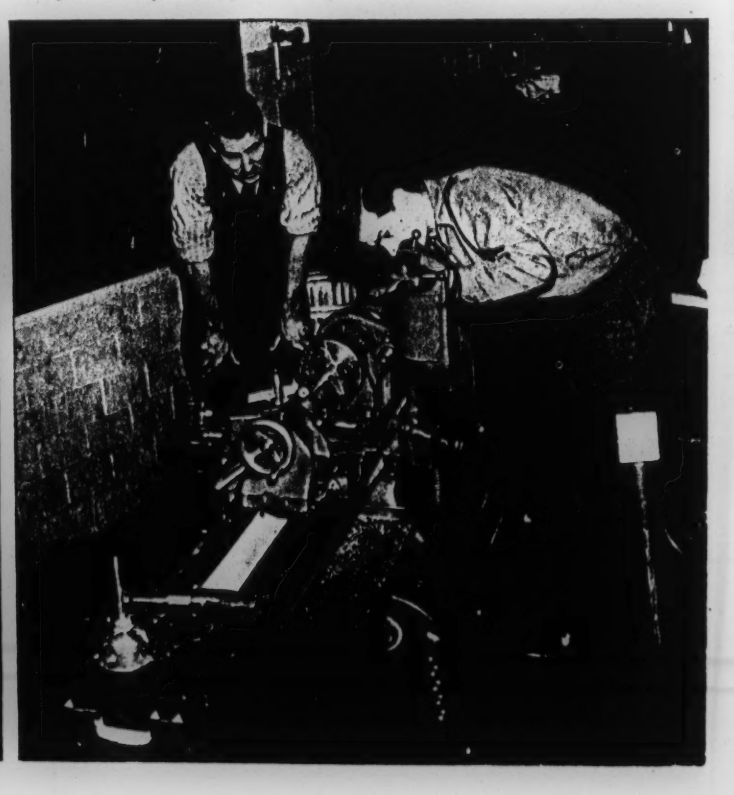
The facilities of U. S. Steel cannot be operated successfully and efficiently without the loyal and effective cooperation of the many thousands of employes who man these facilities and constitute an important segment of the U. S. Steel family. It is the continuing policy of U. S. Steel to do everything reasonably within its power to secure and maintain such cooperation. On the other hand, no enterprise can long continue to function in the public interest under the American competitive system if it is denied the opportunity to carry on its business at a profit. The following of a contrary course must result in drying up the sources of employment, and in depriving the public of goods and services which are needed. The plants and resources of U. S. Steel, in which an average of some 279,000 people found employment in 1945, were provided by the more than 225,000 stockholders of U. S. Steel who are the real owners of the facilities, and as such are entitled to a fair and equitable return on their investment.

U. S. Steel's material contribution to the war effort and ultimate victory depended to a major extent upon the cooperation of the men and women employed during the war period. For the most part a high degree of cooperation and loyalty was attained, and to the employes of U. S. Steel goes high credit for an outstanding war performance.

It is regrettable that a fine over-all performance for 1945 was marred by numerous strikes and work stoppages, many of short duration. These work stoppages occasioned an estimated production loss of 1,868,000 tons of steel

War veteran returning to U. S. Steel's New Jersey shipyard trades his G-I helmet for steel safety hat.

Employe training—An apprentice machinist gets some first-hand pointers from an expert at the trade.



REPRODUCED AT THE NATIONAL ARCHIVES

and 2,305,000 tons of coal, as compared with 871,000 tons of steel and 339,000 tons of coal so lost in 1944. The coal strike in October, 1945, resulted in the most serious single interruption of operations during the year. Estimated man-hours lost by work stoppages in 1945 were 6,117,000, contrasted with 1,783,000 manhours lost in 1944.

JOBS AND WAGES

U. S. Steel's average number of employes during 1945 was 279,274, a decrease of 35,614 or 11.3 per cent from the average employment in 1944. The decrease was occasioned primarily by cancellations of shipbuilding and other war contracts in the latter part of the year and by acute manpower shortages in certain areas throughout the year.

The average number of women employed by U. S. Steel during 1945 was approximately 34,000. At the end of the year about 11,000 women were engaged in production activities, holding jobs ranging from general labor to technical occupations. Thousands more were employed in clerical work.

The average weekly pay of U. S. Steel's wage earners during 1945 was $50.47, without allowing for "wage inequities" under the 1944 directive of the National War Labor Board which is in process of adjustment. Weekly hours of work for wage earners of all subsidiaries averaged 41.6. After eliminating the effect of employe turnover, the 1945 average pay of wage earners in the steel producing subsidiaries' manufacturing operations, excluding any provision for such "wage inequities," was $53.48 for an average work-week of 43.2 hours.

A comparison of the average weekly hours and earnings and the straight-time hourly earnings of the wage earners of U. S. Steel's steel producing companies' manufacturing operations during the years 1939 to 1945 inclusive is as follows:

Year	*Average Weekly Hours (a)*	*Average Straight-Time Hourly Earnings (Excl. Overtime)*	*Average Weekly Earnings (Incl. Overtime) (a)*
1939	34.8	$ .850	$29.72
1940	36.7	.851	31.38
1941	38.7	.950	37.23
1942	39.4	1.039	41.92
1943	44.0	1.061	49.98
1944	46.1	1.114(b)	56.14(b)
1945	43.2	1.144(b)	53.48(b)

(a) Effect of turnover eliminated. (b) Average hourly and weekly earnings for 1944 and 1945 do not include any amount for adjustment of any "wage inequities" which may be found to exist.

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Under the contract checkoff provisions primarily imposed by the National War Labor Board, deductions of $2.8 million for union dues, fees, assessments and fines, were made from the wages of employes during the year and were paid to authorized union officers.

PENSIONS AND GROUP INSURANCE

Under the U. S. Steel Pension Plan, pensions were granted in 1945 to 1,750 retiring employes, and 1,366 pensions were terminated by the death of pensioned employes or for other reasons. At the end of the year there were 15,143 pensions in force. The average length of service of employes pensioned in 1945 was 35 years and these employes received, in addition to any public pensions, an average monthly pension of $34.87.

The following is a summary of the payments made for pensions by the employing companies in the years 1945 and 1944:

	1945	*1944*
UNDER CONTRIBUTORY PART OF PLAN	$ 2,061,524	$ 1,916,890
UNDER NON-CONTRIBUTORY PART OF PLAN —		
For employes retired before January 1, 1940	5,322,547	5,775,409
To trustee for employes retiring after December 31, 1939	21,591,887	25,382,687
TOTAL PAYMENTS FOR PENSIONS	$28,975,958	$33,074,986

During the war period more than 5,800 employes who reached retirement age were requested to stay on the job until the war task was completed and elected to do so.

Beneficiaries of 1,788 employes received death benefits of $4,661,000 in 1945 under the Employes' Group Life Insurance Plan. At the end of the year 219,249 employes were insured under this plan for $580,301,500.

EMPLOYMENT OF VETERANS

Of the 114,000 employes of U. S. Steel who entered the Armed Services, more than 28,000 have returned to the companies for which they formerly worked. In addition, as of December 31, 1945, U. S. Steel had employed about 24,000 other veterans of World War II, or a total of approximately 52,000 veterans.

U. S. Steel aims to aid returning service men and women to take up the job for which each is best suited. Study is given to the application of skills acquired during their service careers to the end that they may qualify for better jobs when available. Efforts to assign physically handicapped veterans to useful tasks have met with considerable success.

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COAST-TO-COAST—U. S. Steel's Sunday evening full hour radio show, "The Theatre Guild on the Air," brings famous plays and players to the nation from the stage of the Vanderbilt Theatre in New York.

PURCHASES OF SAVINGS BONDS

Employes in 1945 continued their extensive purchases of United States Savings Bonds through the payroll deduction plan. Of the total number of employes, 76.3 per cent participated in the plan during the year, payment for such bond purchases aggregating approximately $64.8 million, or 8.2 per cent of the total payroll. Since the inception of the plan in February, 1942, the total maturity value of bonds so purchased by employes has amounted to about $305 million.

TRAINING AND SAFETY

U. S. Steel in 1945 intensified its program, commenced many years ago, of employe training in industrial practices and instruction in accident prevention. Large numbers of new employes and returning veterans made necessary such intensified training and instruction. The objective of safety for employes is expressed by the words of U. S. Steel's forty-year old plant slogan: "We should always keep the fact prominently in our mind that it is the desire of our company and our duty, as well, that we make the safety of the lives of our employes our first, and most important, business."

REPRODUCED AT THE NATIONAL ARCHIVES

OCCUPATIONS

MINING

By Elsa F. Rampendahl

New Jobs for Women

Women have long been replacing men in such positions as bank tellers, rate clerks, and telegraph messengers. Two firms in Denver are now experimenting in somewhat different lines.

One company, which manufactures safety devices and takes contracts for window washing in the business sections, has in the past employed university students for this job. As the turn-over in male employees is becoming more and more a problem, it was decided to give the girls a chance at this work. A week's training period at the home plant is provided; the girls are then sent out to work under the supervision of an experienced window washer in some business block. For a few weeks their work is checked daily by an instructor.

The hourly rate of pay while learning is 40¢. This is later changed to a percentage rate, starting at about 80% until they become more skilled. The rate is finally settled at about 55%. An experienced window washer may earn as much as $45 weekly.

In another instance, a lumber company is training women to do millwork. From a total of 4 in May, when this experiment was begun, the number has been increased to 32. As more and more women are employed, they are upgraded into other work, such as building screens and glazing windows. In this particular line of work, it was found that the women were unable to operate the heavy machines; but they have proved satisfactory whenever these jobs could be broken down. -- Elizabeth Pettus, Manager, Denver District Office.

New Process Salvages Tin and Steel

A process which not only recovers the tin from cans but leaves the steel in a satisfactory condition for blast-furnace scrap, has been developed in the chemical-engineering laboratories of Denver University. It is claimed that this method will prove more economical than any used heretofore, as it does not require electric power or chlorine gas. Instead, caustic soda removes the tin in a few hours through a speed-up method. Addition of lime to the solution precipitates a tin salt, calcium stannate, which is dried, sacked, and shipped to eastern smelters for final tin recovery. -- Elizabeth Pettus, Manager, Denver District Office.

Shipbuilder Hires Workers From Midwest

A California shipbuilding company hires workers from the Middle West at the rate of 1,500 each week. More than 600 are signed up each week in St. Paul, Minn., and St. Louis, Mo., and about 300 from Colorado. Experienced craftsmen are wanted.

New dormitories being built near the shipyard will house 1,250 single men. Work has begun on 800 single-family dwellings. Approximately 300 "war" apartments are already occupied, and 400 additional units are nearing completion.--L. Miriam Lucas, San Francisco Regional Office.

AWVS Sponsors War Wardrobe Class

A course consisting of six lectures is sponsored by a local unit of AWVS. The meet-

ings, which deal with the clothing problem—remodeling, planning of duration wardrobes, colors, materials, styles for older women, maternity clothes, children's clothes, and accessories—are designed to help the American woman plan and buy her wardrobe wisely.—Genevieve A. Powers, San Francisco Regional Office.

State-Wide Staggering of Hours Planned

The State Railroad Commission of California is requesting State-wide enforcement by the Army and Navy of a program of staggered hours to ease congestion of transportation facilities.

It was pointed out that most of the State's transportation facilities are not carrying capacity loads, except during morning and evening rush hours. As new equipment is not available, the only apparent solution to the problem is to stagger the closing hours of business firms, factories, and war industries.—Genevieve A. Powers, San Francisco Regional Office.

Detroit Firm Overcomes Problem

A Detroit firm which manufactures various power units found that, in order to meet demands of war industries and of the armed forces, its plant facilities must be greatly increased. However, the scarcity of steel and the slow process of obtaining other needed materials which are on the critical list, prompted this manufacturer to turn to wood for the new construction. Eight wooden units of a temporary nature were erected. These provide the required floor space, light, and air, and lessen the fire hazards caused by overcrowding.—Catherine Spinner, Chicago Regional Office.

Printers Convert to War Work

Many printing companies are planning to convert their machine shops from the production of presses and repair parts to the production of machine tools for use in the war effort. In some cases, production of plastics is stimulated by the use of plastics in printing. One advantage of plastic plates is their adaptability to cylindrical presses.

One Chicago concern—printer, lithographer, and manufacturer of loose-leaf binders—now uses 150 of its 800 employees on war production.

Another printing company in Chicago, having branches in other cities, has amended its incorporation charter under the laws of the State of Illinois to broaden its manufacturing activities to include war production. A separate metalworking plant is being equipped for the manufacture of munitions.

A printing establishment in Detroit has formed a "Plastics Division for Injection Moulding of Thermosetting Materials." Production is to be for the benefit of manufacturers using plastic molded parts in war production work.—Blaine E. Grimes, Commercial Agent, Chicago Regional Office.

Stores and Schools Aid Farmers

Operators and employees of business establishments in Gaffney (S.C.), together with school children, chose a day in early October to "close up shop," in order to help the farmers of Cherokee County harvest their $2,000,000 cotton crop. In this way, 300 persons were made available for the harvesting, which up to that time had made little progress.—C. W. Martin, Manager, Charleston District Office.

Housewives Asked to Help Retailers

Retail merchants in Mobile, already faced with a "pre-Christmas headache" caused by increases in population and pay rolls and an inadequate number of clerks, have called on local housewives to enroll for a training program designed to ease the shortage of holiday personnel.

A survey conducted by the State Department of Distributive Education indicates that more than 1,000 retail sales clerks will be needed. (Department, variety, shoe, and specialty stores were included in the survey.) Shortages are found in all categories, including regular employees, "regular extras" (employees hired regularly for part-time work), and clerks for the pre-Christmas season only. — Annie S. Howard, Manager, Birmingham District Office.

DIVISION OF
PRESS INTELLIGENCE
1526 14th St., N. W.

NO.

SYMBOL

Sun (ID)
Baltimore, Md.

DATE AUG 25 1942

Colorado Mine Using Women To Replace Men

Alma, Col., Aug. 24 (AP)—At least one Colorado mine is using women to fill job vacancies caused by men going into the army or to more lucrative employment.

H. L. Tedrow, general manager of the London Mines and Milling Company, said six women have been hired in the ore sorting plant. Their job is to throw out rock from crushed gold and silver ore carried along on a conveyor belt.

DIVISION OF
PRESS INTELLIGENCE
1526 14th St., N. W.

NO.

SYMBOL SE-L 2-5

Herald Tribune (IR)
New York, N. Y.

DATE SEP 11 1942

Women Sought for Mining

GLOBE, Ariz., Sept. 10 (AP).—The United States Employment Service has issued a call for 150 women to take jobs at copper mines in this district to replace miners entering the armed services. The Miami Copper Company already has employed ninety-two women, who will be put to work as soon as facilities are available.

DIVISION OF
PRESS INTELLIGENCE
1526 14th St., N. W.

NO.

SYMBOL 1L

Desert News (I)
Salt Lake City, Utah

DATE SEP 12 1942

p.

Mines Of Arizona To Employ Women

MIAMI, Ariz., Sept. 12 (AP)—Women are going to work for Arizona's hard-pressed copper mines, but glamor girls needn't apply.

"It's hard, dirty work and we don't want the glamorous type," R. W. Hughes, general superintendent of the Miami Copper Company, said today as he ordered the hiring of about 100 women to fill jobs heretofore held by men.

The women won't be sent underground, but they'll take over mechanical jobs in the concentrating plant and the machine, pipefitting and repair shops.

It will be the first time that women have taken their places beside men at the copper mines. Even the office staffs have been predominantly male.

The shortage of men and the demands for increased copper production brought this innovation which Hughes believes will be successful. The nearby Inspiration Consolidated Copper Company plans to follow Miami Copper's idea. The mine labor shortage in the west is so critical that miners were "frozen" in their jobs by federal order.

"Women of the Miami district, some of whose husbands, fathers and brothers already work in the mines, are anxious to take the jobs," Hughes said. "This will be even more advantageous than if we were able to bring in men from other places because a housing shortage already exists."

Miami Copper, and all of Arizona's other copper mines are working 24 hours a day, seven days a week.

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DEPARTMENT OF THE INTERIOR

INFORMATION SERVICE

OFFICE OF SOLID FUELS COORDINATOR FOR WAR
For Immediate Release **October 13, 1942.** OWI-646

Solid Fuels Coordinator Harold L. Ickes said today that the coal mining industry, faced with a shortage of manpower, has begun to hire women to keep pace with the Nation's expanding wartime fuel requirements.

He said that the gravity of the growing mine manpower problem is emphasized by a telegram received from Eugene McAuliff, Omaha, Nebraska, president of the Union Pacific Coal Company, stating that the company had hired 22 women at its mine at Rock Springs, Wyoming. Half of them are to work in the mine shops and the remainder are to pick slate on mine tipples. The company is a subsidiary of the Union Pacific Railroad.

Coal production involves grimy, hard, physical labor, which frequently is hazardous. Although women have been employed for generations in the mines of other countries, coal production had been reserved traditionally for men in the United States, prior to the present manpower situation. However, no instance has been reported yet where women are being substituted for actual mining or other underground work in American mines.

The coal mining industry has experienced a net loss of more than 50,000 men since January 1, 1942, according to surveys made by the Solid Fuels Office, and reports indicate that the manpower situation is becoming progressively worse. These losses are due to men entering military service, or shifting to other war industries. The situation is more acute in some sections than in others, and in certain instances the lack of manpower is seriously limiting production capacity.

Coordinator Ickes has requested producers and mine labor to eliminate the provisions in existing industry wage agreements that limit the number of hours that miners can be employed in the production of coal to 35 per week.

P.N. 53051

"All That Glisters Is Not Gold"

MICA, to many people, means memories of the glow of a coal fire shining softly through translucent panes in the door of the old base burner in the sitting-room. And there their knowledge of the subject begins and ends. Today, however, mica has an ever-increasing number of other and important uses; in fact, it has become so vital to the war effort that the Government is sponsoring the reopening of many defunct mines and locating new ones throughout the New England mica area. This extends from the southwest corner of Connecticut, 400 miles northeast, to beyond the Rangeley Lakes in Maine.

"The Government agency in charge of mica has at last admitted that there is a northeastern section of the country," says Roscoe J. Whitney, mineral specialist of the New England Industrial Research Foundation. Mr. Whitney, who has made an exhaustive study of the situation, also adds, "Under proper development and push by the Government, New England can have 100 mica mines in operation during 1943." This is indeed a reasonable assumption in view of the progress made in 1942. In June of that year there were but four operating mines; by November the number had increased to 37. Typical of the mica wealth of the area is the fact that at present no less than four mines are operating on one New Hampshire hill; while in one small section of western Massachusetts there are 10 localities awaiting development. And in Mr. Whitney's expert estimation mica from India, Brazil, or anywhere else is no better than the New England product.

✦ ✦ ✦

At this time the largest and most productive mines are found in sections of New Hampshire, Connecticut, and Maine, with New Hampshire the second largest producing state in the entire country. Mica has recently jumped into the spotlight because it is one of the basic essentials of mechanized warfare. Practically every electrical device is dependent upon the use of mica. Says the chief of the mica division of the WPB, "In dollar value the amount of mica in a finished tank, bomber, or submarine is trifling, but not one of them can function without it." The radio industry, also, uses vast quantities of mica in the manufacture of condensers and tubes.

One of the most productive mines in all New England was found in New Hampshire by a young man who was working for his father in the lumber business. He promptly reported his discovery, with specimens, to Government authorities. The United States Geological Survey and Bureau of Mines sent men to investigate, with the result that the mine was prospected, opened, and is now producing mica of excellent quality, ranging in value from $6,000 to $10,000 a month. From a quarry in Connecticut came 20 tons of mica in one blast; and from this one source it is estimated that at least a carload a week can be shipped. In a good mica mine 100 tons of rock mined will yield approximately five tons of mica, three quarters of which is scrap. This scrap mica—that which does not measure up to strategic quality—is worth from $20 to $30 a ton. Strategic mica is clean, flat and unstained, must trim at least one square inch and be not less than three quarters of an inch wide. Blocks of mica have been mined in New England more than four feet long and 18 inches thick.

✦ ✦ ✦

The Colonial Mica Corporation of New York, with New England headquarters at Newport, N. H., an agency established by the Government to promote domestic mica production and distribution, has stocked air compressors, drills, pumps, hoists, and other necessary equipment with which to form pools of machinery located in the various mica-mining centers. This equipment will be leased to mine owners and operators at nominal rent charges. Another function of the corporation is to examine mica deposits and assist in deciding whether the prospects warrant the leasing of machinery. Also, it will advise as to the best operating methods and co-operate in problems of production, as well as find markets for the mica.

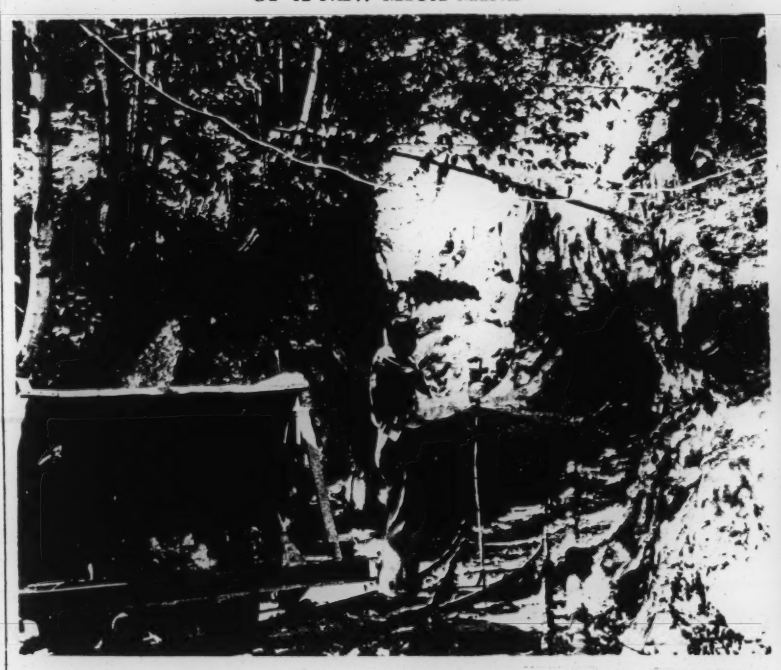
The president of this organization is quoted as saying, "While probably nobody will get rich mining mica, we do believe we can take some of the risks out of the game and at least make it possible for the operators of mica mines to feel that they are doing their bit . . . by furnishing a very necessary material and that they are digging in the ground for it and not in their own pockets."

Mica mining—started in 1803 in Grafton, N. H.—like so many other New England industries of earlier years, was allowed practically to die out. Now the industry is being rebuilt rapidly to a higher level of production than any ever reached before; and so this corner of the country comes into its own again as a producing center of vital importance. After the need for mica becomes less urgent, some of the mines will probably close down again; but never should there be any doubting of the fact that New England has a stockpile of strategic mica ready and secure in its hills, in the event of national need. Meantime evening lights glow once more in long-abandoned hamlets in the hills; the happy voices of children are heard there; and life takes up again where it left off so long ago.

ETHEL M. EATON

NEW ENGLAND COUNCIL OFFICIALS EXAMINE THE PRODUCT OF A NEW MICA MINE

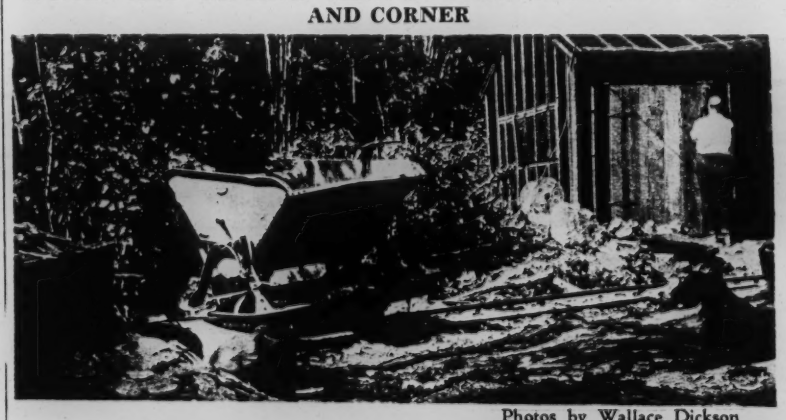
NATIVE MINE FOREMAN WITH HANDSOME SLABS



RICHARD CROSS OF NEW ENGLAND INDUSTRIAL RESEARCH FOUNDATION AT A MOUNTAIN-TOP MICA MINE

VIEW OUT FROM SMITH MINE, CANAAN, N. H.

WOMEN ARE "RIFTING" MICA IN EVERY AVAILABLE NOOK AND CORNER



Photos by Wallace Dickson

MICA COMES FROM THE MINE IN DUMP CARS TO BE SORTED AND BAGGED FOR SHIPPING

U. S. Department of Labor
WOMEN'S BUREAU
Washington

A fuel and iron mill in Colorado -

Women employed in June 1943 in -

wire mill - finishing of nails, making of kegs, packing of nails, and making spools for wire coiling.

bolt mill - inspectors of bolts and nuts, of grinding bolts; operating threading machines, etc.; tapping nuts; general helpers.

electric shop - maintenance work - making new coils, spreading wire, looping, putting cells on, winding small coils, dipping them in varnish and paint and drying in ovens.

12 inch mill - grinding, watching conveyors and miscellaneous light jobs.

rail mill - attendants in scale house and checkers of hot billets.

warehouse - checkers.

scarfing - welding to remove irregularities, defects, cracks, lap wells on steel billets.

Jobs women were doing in a Utah copper mine, as reported to Women's Bureau agent by chief of the division of women and children of the Utah Industrial Commission, May 1943

The Utah law prohibiting the employment of women in the mines has been changed to allow the employment of women on the surface at the mines, but not in the mines.

In the past, women were not even employed in the offices near the mines; mine officials think as many as are needed in the offices will be hired.

At the mine, visited by the State official, there were -

3 cleaners in the machine repair shop who were women; they wash windows, sweep, do general maintenance work.
2 women measuring oil into buckets in the storeroom.
3 women in the water distributing station tending controls and opening and shutting valves which distribute water to the mines; this is light work, watching gages and following orders telephoned in.
2 or 3 women as switch tenders for the cars in the open pit.

Possibilities for further use of women include -

Watching and tending controls in the pump house.
Crane operators in the precipitating plant.

Jobs women were doing in a molybdenum mine in Colorado, visited by Women's Bureau agent, May 1943

14 women tending and watch conveyors from the crushers in the mill; part of the time they operate the tripper controls.
5 women are re-graders of ore.
3 women in lamp houses servicing miners' electric lamps, torches, etc. change batteries, make minor repairs and issue lamps.
1 woman in a laboratory aid in dust division.
1 woman is crane operator in mill.
6 women do guard duty above ground in the mill and at the gates (wear side arms)
Women are hospital aids and attendants, and in the office as clerks.

Jobs women were doing in an aluminum plant in California, visited in 1943

Women are in the tube mill (draw bench operator, finish helper, crane spotter, inspection helper, die polisher, dispatch runner, janitor); in the extrusion plant, in the foundry, in forge shipping, in the time-keeping department.

rfn

Jobs women are doing in a Utah copper mine, visited by Women's Bureau

NATIONAL WAR LABOR BOARD

In the Matter of:	:	
ANACONDA COPPER MINING COMPANY (Operating Benbo, Mount and Gish chrome mines and mills in Montana	:	August 24, 1943
and	:	
UNITED MINE WORKERS OF AMERICA, DISTRICT #50, Local Union #12456, #12478 and #12494	:	Case No. 22-D-7 NWLB 4210-CS-D

AMENDED DIRECTIVE ORDER

By virtue of and pursuant to the powers vested in it by Executive Order 9017 of January 12, 1942, the Executive Orders and Regulations issued under the Act of Congress of October 2, 1942, and the War Labor Disputes Act of June 25, 1943, the National War Labor Board hereby orders:

The terms and conditions of employment which shall govern the relations between the parties, and which, except as modified by mutual agreement of the parties, shall be those set forth in the Recommendations of the Non-Ferrous Metals commission to the National War Labor Board as amended, and are as follows:

1. The plan to determine rates for meals and lodging as worked out before and recommended by the Panel which heard the case at Billings, Montana, is hereby approved.

2. The Company shall grant a bonus of one month's pay to each employee entering the armed forces of the United States, in keeping with the practice in all other operations in the Company, and the Metals Reserve Company shall be advised of this requirement and shall be urged to grant approval, if such approval is necessary, under terms of its contract with the Anaconda Copper Mining Company. If any dispute arises in the application of this provision, the question shall be submitted to the arbitration machinery of the contract, or, upon agreement by theparties, the question shall be submitted to the Non-Ferrous Metals Commission for settlement.

3. All employees covered by the bargaining unit shall be granted an increase of $1.00 per shift in order to bring the rate for miners, as the governing classification for all operation in this field to $7.00 per day, the minimum established for the tentative bracket set for the Montana area. Further study shall be made as to the propriety of the wage bracket set and as to the essentiality of this particular operation, with the understanding that any findings shall govern future action of the proper branch of the War Labor Board in determining whether any further upward revision shall be ordered on the basis of effective prosecution of the war, as a rare and unusual case.

4. The increase herein directed shall be retroactive to November 1, 1942, as offered by the Company and in accordance with the date for other provisions of the contract negotiated between the parties.

The procedure to be followed in making the retroactive payment to these employees who have either quit or been discharged shall be in accordance with the annexed copy of the Board's Resolution of April 2, 1943.

Employees receiving retroactive pay are urged to invest a substantial amount of such pay in War Bonds and Stamps in keeping with the Government's program to combat inflation.

s/ George W. Taylor, Vice Chairman
s/ Frank P. Graham
s/ Wayne L. Morse
s/ Horace B. Horton
s/ Frederick S. Fales
s/ Walter T. Margetts
s/ Louis A. Lopez
s/ Van A. Bittner
s/ John Brophy

(SEAL)

2992

ADVANCE RELEASE

OFFICE OF WAR INFORMATION
NATIONAL WAR LABOR BOARD

ADVANCE RELEASE

For release in A.M. papers
of Wednesday, September 1, 1943

B-940

A $1-a-day increase for 450 chrome miners employed by the Anaconda Copper Mining Company in mines near Columbus, Montana, was unanimously approved today by the National War Labor Board. The approved increase will bring the rate for miners to $7 a day, the minimum of the sound and tested going rates tentatively established for that job in the Montana area.

The United Mine Workers of America, District 50, represents the employees. Anaconda took over operation of the mines in January 1941, on behalf of the United States government, which owns the mines.

In ordering the increase to be effective as of November 1, 1942 -- as offered by the company -- the Board urged employees to put the retroactive pay into war bonds, to help combat inflation.

The Board acted on the recommendations of its Non-ferrous Metals Commission, and adopted the Commission's proviso that a further increase may be ordered if it is found necessary after further study of data on which the wage brackets are set and after further study of "the essentiality of this particular operation."

The majority of a panel had recommended an increase of $1.50 a day, while the minority -- the industry representative on the panel -- recommended $1. The approved increase will restore the 75¢ differential which existed between rates in these mines and in Anaconda-owned mines in Butte before the Non-ferrous Commission granted a $1 increase to Butte miners recently.

The Board's order also provides that a bonus of one month's pay is to be given to each employee entering the armed forces. Such a bonus was recommended by the panel and by the Commission.

The Board approved the parties' agreement, worked out with the aid of the panel, that the company should provide meals and lodging on a non-profit basis, with union representatives allowed to inspect the books as to cost of operation of the mess halls.

The Board's order, as amended, is attached.

THE KENOSHA LABOR

Thursday, MAY 18,1944

Approximately 900 mine workers have been trained in the Utah school, according to reports of WMC. Under this type of "on-the-job" training, student miners receive instructions from skilled miners specially selected as instructors. They are employed by the Utah state board for vocational education. The trainees, paid by the mining companies, are men who have not worked previously in the mines.

In addition to manual dexterity in mining coal, trainees are taught safety rules, including the reasons for them, WMC reported. Training is also given men and women who work on the surface. Two companies in the Carbon county mines, according to WMC reports, are employing women on the surface. Training is given for mine supervisors in addition to coal diggers, machine operators, and maintenance personnel.

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DEPARTMENT OF THE INTERIOR

INFORMATION SERVICE

OFFICE OF SOLID FUELS COORDINATOR FOR WAR
For Immediate Release October 13, 1942 OWI-646

Solid Fuels Coordinator Harold L. Ickes said today that the coal mining industry, faced with a shortage of manpower, has begun to hire women to keep pace with the Nation's expanding wartime fuel requirements.

He said that the gravity of the growing mine manpower problem is emphasized by a telegram received from Eugene McAuliff, Omaha, Nebraska, president of the Union Pacific Coal Company, stating that the company had hired 22 women at its mine at Rock Springs, Wyoming. Half of them are to work in the mine shops and the remainder are to pick slate on mine tipples. The company is a subsidiary of the Union Pacific Railroad.

Coal production involves grimy, hard, physical labor, which frequently is hazardous. Although women have been employed for generations in the mines of other countries, coal production had been reserved traditionally for men in the United States, prior to the present manpower situation. However, no instance has been reported yet where women are being substituted for actual mining or other underground work in American mines.

The coal mining industry has experienced a net loss of more than 50,000 men since January 1, 1942, according to surveys made by the Solid Fuels Office, and reports indicate that the manpower situation is becoming progressively worse. These losses are due to men entering military service, or shifting to other war industries. The situation is more acute in some sections than in others, and in certain instances the lack of manpower is seriously limiting production capacity.

Coordinator Ickes has requested producers and mine labor to eliminate the provisions in existing industry wage agreements that limit the number of hours that miners can be employed in the production of coal to 35 per week.

P.N. 53051

ADVANCE RELEASE ---- ADVANCE RELEASE

McFall -- WMC 3406-7 PM - 4597

WAR MANPOWER COMMISSION

ADVANCE RELEASE:
For Friday Afternoon Papers;
June 2, 1944

Cleared and Issued
Through Facilities of the
Office of War Information

More effective means must be used to get men into the mines if industry is to get an adequate flow of coal needed to keep the Nation's wartime machinery running at full speed, Paul V. McNutt, chairman of the War Manpower Commission, warned today.

At least 30,000 more miners are needed right now, he said, adding that the operators regard this as a minimum. They would be happier if they could get 50,000, he said.

Chairman McNutt explained that the estimated deficit for the coal year ending April 1, 1945, is 39,000,000 tons or about a 20-day supply. This includes both bituminous and anthracite but the production of bituminous is approximately ten times that of antracite.

Getting men for the mines has never been a simple labor problem, Mr. McNutt explained, adding that the task has been made more difficult by the creation of millions of wartime jobs in other industrial fields. He pointed out that in 1940 the average employment in the coal industry was 530,000. This was increased slightly in 1941. Employment began a downward trend in 1942.

Thousands of men were taken from the mines to meet the demands of the armed services. Other thousands found themselves jobs more to their liking in war production plants and civilian activities. This downward trend has continued into this year. Employment now, Mr. McNutt pointed out, is around 450,000 while demands for fuel have increased.

The increased requirements for fuel, he explained, result from the greatly stepped-up activities of war production industries and essential civilian activities. Aside from the factories producing war materials, consumers calling for more coal are the railroads, electric power plants, other public utilities, and metallurgical groups. Exports are also up and will, it is assumed, become greater.

Chairman McNutt expressed belief that although the labor situation in the mines is bad it would be a great deal worse than it is had it not been for the measures taken by the War Manpower Commission. He emphasized the importance of the recruitment campaigns that have been put on in all coal-mining areas and the cooperation shown by industry and the communities in the adoption of plans for the better utilization of labor, improvement of living and working conditions, and general compliance with and enforcement of area stabilization programs.

"These factors," Mr. McNutt said, "have tended to improve the morale of the miners, have reduced turnover and cut down absenteeism, but they are not enough. It now appears necessary that we must provide for a more strategic placement of labor in order to assure the operators that they will have more miners."

(over) X-30174

The output per man has been increased, Mr. McNutt said, by application of the 52½-hour work-week (portal-to-portal) in bituminous coal mining, but this has been counterbalanced somewhat by the fact that the younger and huskier men have disappeared. Their places have been taken by older men.

"The full 52½-hours cannot be worked by many of these older men," Mr. McNutt said. "Some of them just can't take it. Some are unwilling to work that extra time even though they get paid more for it. The longer work-week contributes to more production but we still have the problem of getting more labor into the mines and we must take measures to meet this situation. It has become imperative that there be strict enforcement of area stabilization programs and a better disposition of the labor forces to reach our production quotas in the coal fields."

END OF ADVANCE RELEASE: For FRIDAY AFTERNOON Papers, June 2, 1944.

OCCUPATIONS — NURSING

FROM
The American
Journal of Nursing

1790 Broadway New York 19, N.Y.

Subscription $3.00 a Year
The official publication of
the AMERICAN NURSES' ASSOCIATION
and
the NATIONAL LEAGUE OF NURSING EDUCATION

The following appeared in the December 1944 issue of the American Journal of Nursing.

A GOLD MINE FOR INDUSTRIAL NURSES

NURSING PRACTICES IN INDUSTRY. By Olive M. Whitlock, Victoria M. Trasko, and F. Ruth Kahl. 70 pages. Public Health Bulletin No. 283, Federal Security Agency, U. S. Public Health Service, Washington, D. C. 1944. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price, 15 cents.

THE INDUSTRIAL NURSE AND THE WOMAN WORKER. By Jennie Mohr. 47 pages. Special Bulletin No. 19 of the Women's Bureau, U. S. Department of Labor. 1944. For sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Price, 10 cents.

PLANNING FOOD SERVICE FOR WORKERS IN INDUSTRY. By Katharine Wyckoff Harris. 12 pages. Illustrated. Leaflet No. 27, New York State Emergency Food Commission. June 1944. Available from the Commission, 247 Park Avenue, New York, New York. Free.

HERE ARE three pamphlets that every industrial nurse will want to have. *Nursing Practices in Industry* is a report of a survey of industrial nursing as it is practiced by 12,000 nurses in the United States. The survey was undertaken in order to get at the important facts concerning activities, problems, and needs in this field. It is the first survey of its kind to be conducted on a nation-wide scale. A brief summary of the preliminary findings of the survey and recommendations on desirable industrial nursing practices was published in the July 1943 issue of the *American Journal of Public Health* (page 865). Further analysis of the survey data is the basis of the discussions in this bulletin.

The Industrial Nurse and the Woman Worker analyzes the responsibility of the industrial nurse in regard to working conditions, occupational hazards, accident prevention, planning service and food facilities, and personnel problems that lower women's efficiency on the job.

Planning Food Service for Workers in Industry offers suggestions, floor plans, and details regarding arrangements for food service in a variety of situations.

N. V. B.

Professional NURSES are Needed

VOCATIONAL DIVISION LEAFLET

No. 10

Federal Security Agency, U. S. Office of Education

Professional NURSES are Needed

A Plan for Secondary Schools and Schools of Nursing to Supply Professional Nurses Urgently Needed for Wartime Service

Vocational Division Leaflet

No. 10

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1942

For sale by the Superintendent of Documents, Washington, D. C. Price 15¢

Federal Security Agency • Paul V. McNutt, Administrator

U. S. Office of Education
John W. Studebaker, Commissioner

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FOREWORD

THIS LEAFLET has been prepared by the Occupational Information and Guidance Service, Vocational Division, U. S. Office of Education, with the assistance of the National Nursing Council for War Service, the Subcommittee on Nursing of the Health and Medical Committee of the Office of Defense Health and Welfare Services, the U. S. Public Health Service, and the Nurse Testing Division of the Psychological Corporation.

The National Nursing Council for War Service has ex officio members representing the nursing services of the Federal Government and represents the:

American Nurses' Association.
National League of Nursing Education.
National Organization for Public Health Nursing.
National Association of Colored Graduate Nurses.
Association of Collegiate Schools of Nursing.
American Red Cross Nursing Service.
Subcommittee on Nursing, Health and Medical Committee, Office of Defense Health and Welfare Services.

The Subcommittee on Nursing of the Health and Medical Committee, Office of Defense Health and Welfare Services, consists of five nurse members; liaison members of the Health and Medical Committee representing the U. S. Army, U. S. Navy, Office of Scientific Research and Development, and the American Red Cross, and liaison members representing the nursing services of the American Red Cross and of the following Federal nursing services:

Army Nurse Corps.
Navy Nurse Corps.
U. S. Public Health Service,
  Hospital Division.
  States Relations Division.
U. S. Veterans' Administration.
Office of Indian Affairs.
Children's Bureau.
Office of Civilian Defense.

J. C. WRIGHT,
Assistant U. S. Commissioner for Vocational Education.

FEDERAL SECURITY AGENCY

U. S. OFFICE OF EDUCATION

WASHINGTON

September 1942.

To Chief State School Officers and
City and County Superintendents of Schools:

The demand for professional nurses is urgent. The secondary schools and colleges of this country are not yet sending enough properly qualified candidates to schools of nursing to supply this urgent war need.

Our schools can help immeasurably by (1) supplying accurate information about the profession of nursing to students; (2) furnishing information requested by the school of nursing after a graduate has applied for admission; (3) using best vocational guidance techniques to insure not only an increased supply of candidates for schools of nursing but also a better selected group. In wartime, training facilities must not be wasted on poorly qualified candidates, and, for lack of information and guidance, individuals must not be diverted even temporarily from other channels in which they can best serve.

Many secondary schools already have effective counseling programs which enable them to list pupils who want to become nurses and who are qualified by ability, personality, and previous preparation to enter a school of nursing. For them, the following procedures and information will serve more to confirm than to suggest. To other secondary schools, however, they are offered as a specific means for preparing a list of candidates for nursing schools that, with other lists from all over the Nation, will supply a selected pool from which to draw the best candidates to meet nursing needs.

I have mailed a copy of the attached publication to every secondary school in the United States. Your help is needed in urging the principals under your jurisdiction to prepare the suggested list and at appropriate intervals to notify your State nursing

council for war service concerning prospective candidates.

This is one of the many services our public educational facilities can supply in time of peace, but must render in time of war if our Nation is to survive.

Cordially yours,

JOHN W. STUDEBAKER
Commissioner.

OFFICE FOR EMERGENCY MANAGEMENT

OFFICE OF DEFENSE HEALTH AND WELFARE SERVICES

WASHINGTON, D. C.

DIRECTOR
FEDERAL SECURITY ADMINISTRATION

August 29, 1942.

Dear Commissioner Studebaker:

One of the outstanding shortages of woman power in the war is in the field of professional nursing. We must be sure that the men in our armed forces get the best of nursing care. At the same time, we must preserve in our home communities a sufficient supply of nurses for the maintenance of local health services, and for whatever war emergencies may arise.

The strategic needs in the nursing field are dramatically summarized by the statements of the three Surgeons General of the United States which preface this publication.

The Office of Education is rendering a real service in bringing the nursing situation to the attention of the secondary schools of the country through the pamphlet "Professional Nurses Are Needed."

I feel sure it will aid materially in making known to our young women the opportunities which nursing affords for participation in our war effort, and for a career of lifelong usefulness.

Sincerely,

PAUL V. McNUTT,
Director.

Dr. John W. Studebaker,
Commissioner,
Office of Education,
Washington, D. C.

STATEMENTS OF THE THREE SURGEONS GENERAL

The jeopardy in which this nation now stands is the gravest in all of its history. A difficult war of untold length must be prosecuted to a successful conclusion, whatever may be the cost. The nurses of this country bear a heavy responsibility in this pitiless struggle. It is their unique opportunity to be the first women who are privileged to render to the wounded those ministrations which only a woman can give. Thousands of nurses are needed immediately. Without them, the welfare of the sick and wounded will be seriously affected. The call of the nation to its heroic women of the nursing profession will surely receive the fullest response.

JAMES C. MAGEE,
Major General, U. S. Army,
The Surgeon General.

The Navy has looked with great concern on the apparent shortage of graduate nurses in our nation. Now that war is upon us and the prospect of its continuing over a period of years is a reality, the need for graduate nurses is greater than at any time in our history. The Army, the Navy, the Public Health Service, and the civil population will need more nurses. The present system of training nurses is inadequate, and since the Government has recognized this, every effort should be taken at this time to double the training facilities for nurses. A strong appeal should be made at once to the young women of this country to enter training in this most important profession.

ROSS T. MCINTIRE,
Rear Admiral (MC),
Surgeon General, U. S. Navy.

Nursing is on the front line in all our war effort and will occupy a place of primary importance in world-wide reconstruction after the war. The enrollment in our nursing schools must be increased greatly if we are to provide nurse power to fill the ranks on this front line. The Government recognizes this need and has appropriated funds to increase educational facilities and to establish scholarships for students. No qualified young woman should be deterred from entering an approved school of nursing because of financial need.

THOMAS PARRAN,
Surgeon General,
U. S. Public Health Service.

PROFESSIONAL NURSES ARE NEEDED

RECIPROCAL ACTION OF SCHOOLS OF NURSING AND SECONDARY SCHOOLS FOR INCREASING THE SUPPLY OF PROFESSIONAL NURSES

I. Needs

America's fighting forces will require approximately 50,000 nurses by July 1, 1943. For every nurse who goes into service there must be a replacement at home. The rapid expansion of civilian and governmental hospitals, increases in industrial employment, the development of boom towns, the emergency medical plans for civilian defense —all create demands for more and better qualified nurses. In the reconstruction after the war, nurses in increasing numbers will be needed for service in many lands and for the expansion of hospitals and public health facilities at home. The sources of our present supply of professional nurses are: (1) The present professional registered nurse group and (2) an increasing enrollment in State-approved schools of nursing.

II. Mobilizing the Present Supply of Professional Nurses

The National Nursing Council for War Service has undertaken as one of its major functions the mobilizing and distributing of nursing service during the war. This involves:

(*a*) Assisting in maintaining the supply of nurses for the armed forces through enrollment in the First Reserve of the American Red Cross Nursing Service.

(*b*) Assisting with the fair and just distribution of the nursing personnel that remains for civilian needs.

(*c*) Finding and returning to active service as many as possible of the 116,000 inactive nurses who are physically and mentally fit.[1]

(*d*) Finding and returning to active service those nurses who did not respond to the National Survey.

(*e*) Planning expeditious refresher courses for nurses who, inactive for some time, can return to general nursing practice.

(*f*) Providing advanced nursing education programs in colleges and universities for nurses who can help to fill the administrative and teaching ranks and specialized fields relating to war services.

---

[1] The National Survey of Registered Nurses, 1941. Approximately 300,000 graduate registered nurses filed replies. Forty percent reported themselves as inactive.

III. Recruiting Applicants for Schools of Nursing—Functions of School of Nursing

The total enrollment in State-approved schools of nursing as of February 1, 1942 was 100,000. Of these, 44,306 were new students. However, to meet fast growing military and civilian needs, the Subcommittee on Nursing of the Health and Medical Committee, Office of Defense Health and Welfare Services, has set goals of 55,000 new students in 1942–43, and 65,000 in 1943–44. In other words, there is need for 10,000 additional new students each year. State quotas have been worked out for the school year 1942–43. These quotas have been sent by the National Nursing Council for War Service through its recruitment committee to the State Nursing Councils for War Service.[2] To achieve these quotas:

1. Each school of nursing, when not already informed, should find out the annual quota for its State.
2. Each school of nursing should determine the best means whereby it can expand its enrollment to contribute to that quota. *No school should undertake the admission of more students than its instructional and clinical facilities will permit,* but safe expansion may take place through such means as:
   - (*a*) Pooling teaching facilities with other local schools of nursing.
   - (*b*) Securing appropriate instruction in the biological, physical, and social sciences from a local college or university.
   - (*c*) Securing new affiliations in clinical courses when indicated.
   - (*d*) Securing when necessary and when eligible, financial assistance for expansion through Federal funds from the U. S. Public Health Service.
3. Each school of nursing should give thought to the number of classes it can admit yearly, and safely accommodate. By increasing the number of classes, students can be graduated at shorter intervals. Unlike colleges and universities, schools of nursing do not have long-term vacations that can be used for speeding up the program.
4. Each school of nursing should make every effort to provide financial aid for desirable students, either in the form of scholarships or of loan funds. If the school cannot give the necessary aid, it should seek assistance:
   - (*a*) By approaching the board of trustees, the school of nursing committee, the alumnae, friends of the school, local service clubs and women's organizations, and others.
   - (*b*) By applying for Federal funds through the United States Public Health Service for grants for scholarship tuitions and other fees. Any school affiliated with a hospital having a daily average of 100 or more patients may apply for scholarships covering tuition and other entrance fees for qualified students.

[2] See Appendix B for list of State Nursing Councils for War Service.

(c) By referring especially well-qualified applicants whose needs cannot be met otherwise to the National Nursing Council for War Service, 1790 Broadway, New York City.

5. Each school should give individual consideration to married applicants, provided such applicants meet all other admission requirements. The National Nursing Council for War Service has recommended "that schools of nursing be urged to retain students who marry during their program."
6. Each school should examine its file of students who did not complete the program because of marriage, family obligations, financial reasons, or other good cause and urge such students to return to the school *provided their records show ability and good personal qualifications.*
7. Each school of nursing should make every effort to give attention to the individual problems of its students to prevent unnecessary loss of students before graduation.
8. Each school of nursing should review the secondary school sources from which it usually draws students. The school should cooperate with the State nursing council recruitment committee, in one or several of the following ways:

   (a) By sending to the State nursing council a list of the secondary schools from which it usually draws its students, indicating the sources which have supplied particularly satisfactory candidates in the past. This list should be accompanied by a statement of the dates when students are admitted to the school of nursing and of the maximum number of students it can admit.

   (b) By coordinating its own recruitment efforts with those of the State nursing council through such activities as

      (1) Holding open house for prospective students at effective intervals to interest promising high-school students and their counselors.

      (2) Furnishing attractive literature on nursing for student use or joining in publication of a State or regional list of schools.

      (3) Urging doctors, alumnae, and students connected with the hospital or school of nursing to do what they can to interest possible candidates.

9. Each school of nursing should make every effort to accelerate its program in conformity with the suggestions proposed by the National League of Nursing Education which provides for courses of 24, 28, and 30 months' duration.

IV. Recruiting Applicants for School of Nursing—Functions of the Secondary School[3]

1. Each secondary school should secure information as to the minimum admission requirements to schools of nursing from the board of nurse examiners in its State.[4]
2. Each secondary school should then list all seniors whose qualifications satisfy the minimum admission requirements and who rank in the upper half of their class.
3. This selected group of students should be fully informed about opportunities for professional service in the nursing field and preparation for it. Students who indicate an interest in schools of nursing in other States should be aided by the secondary school in securing information about admission requirements from the State board of nurse examiners in the respective States. Students in need of particular information may write to the National Nursing Council for War Service, 1790 Broadway, New York, N. Y. The entire group should be urged as a patriotic service to consider seriously entrance into the profession of nursing which holds such an essential place in the winning of the war and the peace.
4. Interested pupils on the list may then be tested by psychological and subject-matter tests selected from those suggested in Appendix A and their personality qualifications appraised by the use of a personality report. See form following page 16.
5. This list of qualifying students will then contribute to a pool from which the total number requested by all schools of nursing will be recruited. *No pupil should be included in this pool without the necessary academic and personal qualifications.* Qualified students without financial means should be included and steps taken to direct them to schools where financial aid is available. A list of such schools may be obtained from the State board of nurse examiners.
6. Juniors whose records indicate scholastic and personal aptitude should be urged to select their schools of nursing as early as possible and to make plans to meet the specific requirements for entrance.
7. The secondary school should assign specific personnel, preferably a trained counselor, to carry out all of these provisions.

V. Liaison Among Schools of Nursing, State Nursing Councils, and High Schools

1. After the preliminary steps in III and IV have been taken, a plan of procedure which has been approved by the State nursing

[3] For detailed steps, see pages 6–9.
[4] See Appendix B for list of State boards of nurse examiners.

council for war service should be put into operation, in order to bring the potential candidates and the schools of nursing together. To conserve the effort of all concerned but to make full provision for varying situations, plans should clear through the State nursing council for war service or the local council. When the secondary school notifies the State nursing council of its pool of potential student nurses, it should indicate its preferences and make suggestions regarding the methods to be used in recruiting.

There is need for good planning in arranging visits to high schools for purposes of recruitment. Without a State-wide plan, large accessible high schools may have too many visitors, and small or less accessible schools may be neglected. It will be optional with each State nursing council whether: (*a*) To carry on a centralized program of direct contact with secondary schools, in which the schools of nursing play an important supplementary part, or (*b*) to leave recruitment entirely to individual schools of nursing.

2. Whichever plan is adopted by the State nursing council, individual schools of nursing may make the appropriate arrangements to send to the secondary schools a representative who may be the director, a carefully selected member of the faculty, or an alumna especially prepared for the task. She should be ready to:

   (*a*) Confer with the principal, student counselor, and heads of the science departments.
   (*b*) Speak before the high school if desired.
   (*c*) Arrange individual conferences with potential candidates.
   (*d*) Carry as far as possible procedures for the admission of acceptable candidates.

3. Correspondence as a substitute for personal visits may be suggested by the State nursing council for war service in some instances, since the 1,300 State-accredited schools of nursing and the 48 State and the District of Columbia nursing councils can hardly hope to make personal contact with all of the more than 28,000 secondary schools.

SUGGESTED PROCEDURES IN THE SECONDARY SCHOOL

The war need for professional nurses prompted the planning of the procedures which follow. However, in considering these suggestions it is important to remember that the demand may be equally urgent in other occupations. The essence of the school's function is to counsel students so that they will choose and prepare for work suitable to their aptitudes and interests and in keeping with the changing needs of our war economy.

Because student nurses with better education and greater maturity than the average are needed, every effort should be made to encourage all qualified young women wno can do so to go to college first, at least for 2 years, or to enroll in a 4-year or 5-year collegiate nursing program. These students may be assured that their longer period of preparation will enable them to carry more responsibility as graduate nurses.

The secondary schools are already being asked to supply an increasing number of candidates for the nursing program this year. Predictions indicate a progressive increase, year by year, thereafter. The secondary schools are also being requested to do all that they can to insure that the candidates they send on have the ability, personal characteristics, and preparation that will assure their success in the nursing program as far as possible.

Schools with established guidance procedures may use the following outline as a check list. Other schools may follow the entire plan as proposed. Even the smallest high school will find the steps practicable with the relatively few students concerned. In accordance with an established principle of guidance, the steps should be taken in such a way as to encourage rather than to supplant student initiative and responsibility in obtaining information, in analyzing capacities and problems, and in making decisions and plans. Since the schools of nursing and the State nursing councils are playing a reciprocal part in these procedures and have a copy of them, they will expect the secondary schools to take the steps suggested.

Suggested Steps To Be Taken

1. Prepare a list of twelfth-grade girls who have completed, or will have completed by the end of the year, the subject requirements established by the nurse practice act or board rules governing the practice of nursing in the State.[5]

[5] The information may be obtained from the State board of nurse examiners. See Appendix B for list.

2. Cross off the names of those who do not rank in the upper half of their class. Place on a collateral list anyone who falls below this rank, but whose other qualifications are outstanding and whose rank is due to some unusual cause.
3. Supply the listed pupils with occupational information on professional nursing, using group or individual methods. For information and references see occupational brief which follows. Urge interested pupils to share the information with their parents.
4. Eliminate next the names of those who state that they are definitely *not* interested in considering nursing as a profession for themselves, but retain the names of those who are not sure. See that no eliminations are due to inability to finance nursing education.
5. Inform the parents of each girl who remains on the list that she is a possible candidate for a school of nursing and that information concerning her suitability for nursing will be supplied to nursing recruiting authorities. If there is parental objection in the face of strong interest on the part of the girl, the counselor may be able to work out the situation to the satisfaction of all concerned by providing additional information through a home visit, by arranging for the parents to consult with representatives of the recruiting committee, or to visit a school of nursing, or other means.
6. Record on Form A, Pool of Candidates (see p. 18) under the column *Physical handicap* the word "None" if the pupil's health record and personal appearance reveal no physical disability or noticeable physical defect which would handicap her in nursing, such as facial disfigurations, badly crossed eyes, record of previous tuberculosis, or frequent absence for illness. If there is any evidence of such disability or physical defect, state the nature of it in this column.
7. If a recent medical record is not available at the school, from the family physician, or other community health facility, make every effort to arrange for a complete medical examination. Much may be done in cooperation with the school's health service to eliminate remediable physical defects during the months that may elapse before the student graduates. Those with serious health defects may save time and disappointment by consulting the recruiting committee or the appropriate school of nursing before making all other preparations.
8. Administer standard tests to the remaining group. See Appendix A for a list of suitable tests measuring general intelligence and general educational achievement. Record the names of the tests used and the individual results on the condensed Form A. Results of similar tests recently given may, of course, be substituted.

But scores on a standardized general verbal intelligence test, a reading test, an arithmetic test, and a science test are desirable.

9. Complete the recording of scholastic average and grades in particular subjects on Form A, from cumulative record or report cards.
10. Have several teachers who know the pupil intimately fill out a personality form for each pupil on the list. Then prepare a composite report for each pupil following suggestions supplied on page 16. When possible, teachers should illustrate each predominant trait by an example of specific behavior. If you do not already have a suitable appraisal form, a suggested one which may be purchased [6] is reproduced following page 16.
11. Have each pupil fill in a personal information blank. If you do not have a satisfactory one in use, the form on page 17 is suggested as appropriate for the purpose.
12. Arrange an individual conference with each pupil on the list. Before seeing her, review the information already assembled. During the interview look especially for evidences of the presence or lack of:

    (*a*) Good health and physical stamina.
    (*b*) The mental capacity and the drive to complete a nursing program.
    (*c*) Liking for science.
    (*d*) Thoroughness and powers of observation.
    (*e*) Self-reliance and a mature attitude.
    (*f*) Dependability, resourcefulness, initiative, and courage.
    (*g*) An objective liking for and sympathy with people, tolerance, and a sense of humor.
    (*h*) Tryout experiences, such as courses in first aid and home nursing, care of sick children, and home economics training.
    (*i*) Parental approval of interest in nursing based upon the knowledge of what it involves.
    (*j*) Age in relation to legal requirements and length of nursing program planned. (Anyone under 18 should be encouraged to consider the collegiate nursing program not only because of the legal requirements but also because of the importance of maturity.)
    (*k*) The ability to finance the nursing program.
    (*l*) Preference for a collegiate or noncollegiate program. (See discussion in occupational brief which follows.)
    (*m*) Preference for a particular field of nursing.
    (*n*) Preference for a particular school of nursing.

13. Prepare a brief summary of the interview.
14. Complete Form A from interview notes and information assembled for interview.
15. Unless a different procedure has been suggested by your State nursing council for war service send a copy of Form A with a letter to the State nursing council. If you have a February graduating class as well as a May or June class, group these ac-

[6] National League of Nursing Education, 1790 Broadway, New York, N. Y., $1.10 per hundred copies; $4.50 per 500 copies; and $8 per 1,000 copies. Copyrighted. NOT TO BE DUPLICATED.

cordingly and inform the council of the two separate dates of graduation.

16. Indicate in your letter to the State nursing council your preference as to the time and nature of arrangements for the candidates in your school to meet with nursing representatives. The State nursing council or the local council will then inform you as to its plans for meeting your needs, by arranging for one or more representatives to visit your school or for contact to be made by correspondence, where visitation is impossible to arrange. If you already have in operation a satisfactory program of cooperation with local schools of nursing, inform the State council to that effect.

17. The following arrangements should be made for nursing representatives when they visit your school:

    (*a*) A conference with the counselor or other member of the school staff acting in that capacity who has been designated to handle the secondary school's part in this program and who should be prepared with a written or oral report covering pertinent recommendations concerning outstanding candidates, particular problems, scholarship needs, and other subjects of interest to the nursing representative.

    (*b*) Suitable interviewing quarters and arrangements for conferences with interested pupils and parents.

    (*c*) Provisions for the representative to see the school physician or nurse, particular teachers, and any other members of the school staff.

    (*d*) Individual records available in folder or envelope on each student who is to be seen containing:

        1. Cumulative record.
        2. Health record.
        3. Personality rating.
        4. Student information blank.
        5. Test records.
        6. Summary of counselor's interview to discuss possibility of nursing.

16. In the individual interviews, the nursing representative will instruct each pupil as to further steps to be taken. She will inform the counselor about recommendations made. Difficult problems should be worked out jointly with the school counselor.

17. Later the secondary school will receive final admission forms to be filled out by students who have made formal application to a particular school of nursing.

18. A similar selection procedure should be followed with those in the junior classes so that curriculum, physical, financial, and other adjustments may be worked out in the intervening time. With those who plan to take the collegiate program the possibility of acceleration in the secondary school may be considered where the student is outstanding.

19. Keep in touch with your State or local nursing council for war service for current information.

OCCUPATIONAL BRIEF ON PROFESSIONAL NURSING

A PROFESSIONAL NURSE is a graduate of a school of nursing which meets the minimum requirements set by State law, and who practices nursing by virtue of her professional preparation, knowledge, and the license she holds to practice her profession in the State. Usually, her activities fall into three groups: "Those dealing directly with patients, helping them get well and teaching them to keep well; those involving administrative responsibilities; and those in which education of nurses—undergraduate and graduate—is the dominant interest."[7] In general, there are four major fields of nursing: Private duty, hospital and institutional, public health, and nursing education.

On the civilian front, *private duty nurses* are still numerically the largest group. Their services "should be reserved for acutely ill patients and for patients who require special treatments which can be given safely by registered nurses only, and where the character and limited amount of nursing service available for patients makes it necessary for private duty nurses to be employed."[8] Among them are those whose income depends primarily on the number of patients in a locality who can afford to add the cost of individual nursing service to the other costs of medical care. According to reports of the Private-Duty Section of the American Nurses' Association, private-duty nurses, on an average, charge for their services at the following rates: $5 for 8-hour service; $7 for 12-hour service; $8 for 20-hour service. The median annual income for private duty nurses working full time in 1936 was $1,260, but is believed to be somewhat higher at present.

Hospital and institutional nurses comprise all the registered nurses who are employed by institutions for the acutely ill, convalescent, or chronic. Since a hospital is made up of many special departments such as medical, surgical, obstetric, psychiatric, X-ray, and dispensary, it offers wide opportunity for broad experience and specialization in clinical nursing. In general, positions held by nurses in this field are staff nurse, head nurse, supervisor, assistant director (day or night) and director of nursing. Salaries range from $840 a year with maintenance for the newly appointed staff nurse (the beginning rate in Army and Navy hospitals is $1,080) to $6,000 a year with maintenance for the director of nursing in a large hospital.

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[7] Reference 7, Bibliography p. 15.

[8] Distribution of Nursing Service During War. National Nursing Council for War Service, New York, May 1942. p. 22.

Public health nursing includes all nursing services organized in a community to assist in carrying out any phase of a public health program. The public health nurse may serve as: A visiting nurse; a county, city, or State health department nurse; a school or an industrial nurse; or she may be in an administrative or teaching position. Although she may visit and care for the sick at home, her service is always directed toward prevention of disease and education for healthful living. Positions she may hold in a voluntary (visiting nurse or other privately financed organization) or in an official (State, county, or local health department) agency, include those of staff nurse, supervisor, consultant in a special service (such as venereal disease or industrial hygiene), educational director and director, with salaries ranging from $1,200 to $6,000 a year without maintenance.

Nurses in the field of nursing education may teach students in schools or departments offering basic or advanced nursing programs; some of these are operated by hospitals and some are divisions or schools within colleges or universities. They may also direct, plan, or supervise the staff education programs for nurses in hospital or public health nursing or other agencies; or teach classes in hygiene and home nursing in high schools. They may be known as instructor, supervisor, professor, principal, director, dean consultant; salaries are from $825 to $6,000 a year, with or without maintenance. Another small but important group in the nursing education field are nurses employed on State boards of nurse examiners who safeguard the minimum standards set by law or board rule in the States to control the practice of nursing. Some hold important positions with professional organizations.

The United States Government is the largest single employer of nurses. The Army and Navy secure their nurses chiefly through the First Reserve of the American Red Cross Nursing Service which maintains the official reservoir for the Army and Navy Nurse Corps. Nurses in other branches of Government service are secured through the United States Civil Service Commission. They may serve in hospitals, nursing education, or public health nursing fields and are employed by the U. S. Public Health Service, U. S. Veterans' Administration, Office of Indian Affairs, and the Children's Bureau.

Other nurses, among them those employed in doctors' offices or serving on the staffs of professional nursing organizations, cannot readily be classified in any one field. There are also many others who have entered fields closely related to nursing such as laboratory, social, or library work, and are making valuable contributions there because of their nursing knowledge.

The majority of nurses give a generalized type of nursing service. Many, however, specialize in such services as psychiatric, obstetric, or industrial nursing. Those who keep up with the developments in

clinical medicine and nursing, and those who can adapt readily and graciously to the individual demands of doctor, patient, patient's family and coworker, have no difficulty in securing and holding interesting and satisfying positions. On the other hand, the many nurses who marry have the preparation to become wives and mothers respected and influential in their own communities and especially well equipped in important aspects of homemaking.

State license.—Before a graduate can receive a license to practice her profession, under a title protected by the law, she must pass State board examinations. Every State has its own nurse practice act and does not necessarily recognize registration in other States. The specified qualifications which may be required by the laws or board rules in a State in order to obtain a license may cover: Age (usually 21 or older); education prior to entrance to school of nursing (usually graduation from high school); length of the professional nursing program; and other qualifications relating to residency, citizenship, character, and health.

ADMISSION REQUIREMENTS.—The minimum educational requirement for entrance to schools of nursing is high-school graduation or 16 units of high-school work including usually: 3 or 4 units in English; 1 or 2 units in mathematics (algebra or geometry); 2 or 3 units in science, including chemistry, physics, or biology; 1 or 2 units in history, civics, and economics; and the remaining units in electives. Some schools of nursing require 1 or more years of college work for admission, although many of these do not offer a collegiate program. In some States rules and regulations established by State boards of nurse examiners outline the content of the preliminary education required for admission to schools of nursing. Within the legal framework, schools of nursing set their own requirements which differ in the various schools. A check of acceptable subjects should be made therefore with both the catalog of the school of nursing and the secretary of the State board of nurse examiners.

Collegiate schools of nursing offering a 4- or 5-year program leading to a degree may admit applicants at age 17, but 18 to 35 is the customary age range in which an applicant must fall. The preferred range is 20 to 25. Good health based on a thorough physical examination, including a chest X-ray, is important. Remediable physical and dental defects should be corrected. Desirable personal qualities are a liking for people, flexibility, dependability, initiative and resourcefulness, courage, tolerance, a sense of humor, keen powers of observation, and a spirit of service.

SCHOOLS OF NURSING.—Approximately 1,300 schools of nursing in this country meet the minimum requirements set by law in the States in which they are located and many go beyond them. The National League of Nursing Education is in the process of evaluating

the programs schools offer. There are two types of schools: Collegiate and hospital.

The approximately 80 schools of nursing connected with universities are either established as constituent parts of accredited colleges or universities or they may maintain close educational or organizational relationships with them and have access to their resources and facilities. Collegiate schools of nursing offer three types of programs: (1) The combination academic and basic professional program which covers a period of 4 or 5 years and leads to a baccalaureate degree and a diploma in nursing; (2) the basic professional program offered to applicants who have had 2 or more years of college work, leading to the Bachelor of Nursing degree or to the baccalaureate degree and diploma of nursing; and (3) a program offered to college graduates only, leading to the Master of Nursing degree. Schools which meet stated standards of organization and education are eligible for membership in the Association of Collegiate Schools of Nursing. Not all schools having connections with colleges and universities have sound programs. Therefore it is important for prospective students to know what to look for in choosing a school, as suggested below.

The course of instruction in the approximately 1,200 schools of nursing operated by hospitals usually covers a period of 3 years and leads to the nursing diploma.

CHOOSING A GOOD SCHOOL OF NURSING.—The schools naturally vary in the type and quality of preparation offered. The essentials of a good school of nursing have been set forth in a manual prepared by the National League of Nursing Education.[9] Among the leading questions to which affirmative answers should be obtained when choosing a school are:

1. Does the diploma of the school of nursing entitle the graduate to take State board examinations in the State in which the school is located and in which the graduate plans to practice?
2. Does the school of nursing meet at least the minimum requirement of the American Red Cross Nursing Service that the school be in a hospital maintaining a daily average of at least 50 patients and that it offer experience in all four essential services: Medicine, surgery, pediatrics, and obstetrics?

If the student can secure an affirmative answer to the following questions, she may be assured that she is choosing a school above minimum standards: Does the school of nursing offer, through its own hospital or through cooperation with some other hospital or agency, experience in medical, surgical, maternity, and communicable disease nursing, and in the care of children? Does it, in addition, offer expe-

9. Reference 1, Bibliography p. 14.

rience in the care of the mentally ill? Does it maintain an affiliation with a public health nursing agency?

If the student is interested in entering a collegiate school of nursing, she should write to the Committee on Recruitment of Student Nurses, National Nursing Council for War Service, 1790 Broadway, New York City.

COSTS OF TRAINING.—The costs of nursing school programs should be checked with each school. Expenses include:

Tuition—which varies from "no charge" to $2,000 for the entire program, charged by a few schools which are integral parts of colleges and universities. In schools of nursing where tuition fees are charged the median fee in 1939 was $75.

General fees—which vary from nothing to approximately $300. They may include charges for health service, textbooks, uniforms, laboratory use, and other fees.

Incidentals—which depend on the student's personal needs; $10 a month should cover them.

The majority of schools make no charge for maintenance during the "clinical period," during which the student gives useful service to the hospital while learning nursing.

STUDENT AID.—Several schools of nursing have loan and scholarship funds. A considerable number have also received special funds for tuition scholarships from the Federal Government through the U. S. Public Health Service. Scholarships and loan funds may be available from some of the nursing organizations. Information may be obtained from the National Nursing Council for War Service, 1790 Broadway, New York, N. Y., or from the director of any school of nursing.

Pamphlet References

1. *Essentials of a Good School of Nursing.* National League of Nursing Education, 1790 Broadway, New York City. 1942. 75 p.
2. *Facts About Nursing.* Nursing Information Bureau of the American Nurses Association, 1790 Broadway, New York City.
3. *How to Enter the Field of Public Health Nursing.* National Organization for Public Health Nursing, 1790 Broadway, New York City. 1942. 11 p. Free.
4. *Nursing Education for National Service.* American Council on Education, Jackson Place, Washington, D. C. 1942. 35 p.
5. *Nursing and How to Prepare for It.* Nursing Information Bureau of the American Nurses Association, 1790 Broadway, New York City. 1942. 23 p. Free.
6. *Nursing and the Registered Professional Nurse.* Nursing Information Bureau of the American Nurses Association, 1790 Broadway, New York City. (In preparation, September 1942.)

7. *Professional Nursing and Auxiliary Services.* Nursing Information Bureau of the American Nurses Association, 1790 Broadway, New York City. 1942. 24 p.

Motion Pictures and Film Strips

American Red Cross. William J. Gans Co., 19 East 47th Street, New York, N. Y. Footsteps (1939). 15-minute silent; 10-minute sound; 16 mm.; 35 mm. motion picture; presents preparation needed for nursing and opportunities with emphasis on Red Cross Nursing. (A new film on nursing is in preparation.)

Harmon Foundation, 140 Nassau Street, New York, N. Y. Nurses in the Making (1937). 30 minutes; silent; 16 mm. motion picture; presenting program of preparation and opportunities in nursing. Nursing Is a Grand Career (1941). 35 mm. silent "still" film strip; single or double frame; about 40 slides in strip form showing preparation needed for nursing and opportunities in nursing.

Metropolitan Life Insurance Company, 1 Madison Avenue, New York, N. Y. Florence Nightingale (1941). 35 mm. silent "still" film strip; historical, presenting life of Florence Nightingale and her influence on modern nursing.

University of California, Extension Division, Department of Visual Instruction, 813 South Hill Street, Los Angeles, Calif. Nursing a Career of Service (1941). 1,200-ft. reel; 16 mm. silent motion picture; technicolor.

Vocational Guidance Films, Inc. W. O. Gutlohn Inc., 25 W. 45th Street, New York, N. Y. Nursing (1942). 10 minutes; 16 mm.; sound, motion picture; based on pre-war pamphlet "Nursing and How to Prepare For It."

PERSONALITY APPRAISAL

Suggestions for Use of Personality Report

The selection and guidance of students for nursing should be based upon observation of behavior and appraisal of personality factors fully as much as upon records of achievement, health, and other factual records. Socially acceptable personality traits are especially important in nursing, not only from the standpoint of the nurse's own personal adjustment but also because of the effect of her personality upon her patients.

The suggested personality appraisal form reproduced on the next page presents terms characterizing or describing behavior in areas of particular importance in nursing; they are not ratings. Many schools of nursing send such a form to the secondary school to be filled out for each applicant whose admission they have under consideration. It is recommended that separate forms be used to procure the judgments of a number of the pupil's teachers and that they base their appraisal upon her usual and typical behavior rather than upon isolated or unusual instances. The composite appraisal of each student may be shown on a personality report form by inserting in each square the number of teachers who checked that behavior characteristic, and by recording when possible one or two specific instances illustrating the pupil's most characteristic behavior. If the use of this form is impractical in any given school, however, some other method of personality appraisal will be acceptable.

Personality Report

School of Nursing.....

Address.....

Name of Applicant.....

Please return this form directly to the Director of the School of Nursing

Selection and guidance of students are based on scholastic records of achievement, health, and other factual records. Personality is especially important in nursing. You will greatly assist both the applicant and the school of nursing if you will rate her with respect to each question by placing a check mark in the square which represents your evaluation of her. If you have had no opportunity to observe the applicant with respect to a given characteristic, please place a check mark in the square opposite the line "No opportunity to observe."

In the rectangle to the right of each indicated judgment, describe briefly and concretely significant performances and attitudes which support your judgment and which you yourself have observed.

	pression ☐ No opportunity to observe	
E. How does she adjust to changing situations?	☐ Adjusts readily to all situations ☐ Adjusts to most situations with little difficulty ☐ Probably average in ability to adjust ☐ Adjusts slowly and only fairly well ☐ Does not adjust to changes ☐ No opportunity to observe	Please record here instances that support your judgment.

The instructions and rating scale on this form are an adaptation of the Personality Report prepared by the American Council on Education and are used with the permission of that organization.

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1. Is there any marked defect, not included in the above questions, in the applicant's personality, character, or preparation?.....(Please specify).

2. What do you consider the chief qualities of strength or weakness of the applicant? If possible, give illustrations.

3. Do you place full confidence in her integrity?

4. In what activities has she taken a noteworthy part?

5. Has she so far as you know any physical or constitutional weaknesses?.....If so, please specify.

PERSONAL INFORMATION (to be filled out by student)

Grade _____

Section _____

Name _____ Date of birth _____
(Last) (First) (Middle)

Address _____ Phone _____ Race _____ Age _____

Occupation of father _____ of mother _____

Are both parents living at home? _____ How many brothers and sisters have you? _____ List your responsibilities at home _____

_____

at school _____

elsewhere _____

I have been paid for doing the following types of work (indicate in parentheses whether such work was full-time, after-school, or summer employment) _____

_____

Kinds of handwork I have done _____

My best grades are in _____

My poorest grades are in _____

In my leisure time I enjoy most doing the following _____

I usually spend my leisure time as follows _____

Hobbies I have followed for more than 1 year _____

_____

Check in appropriate columns:	I enjoy	I dislike	I find easy	I find difficult
Science subjects				
Meeting new people				
Household duties				

I have received information about nursing from the following printed material:

_____

From other sources (indicate) _____

What questions about nursing would you like to have answered? _____

_____ Have you definitely decided to study nursing? _____ If so, when and where? _____

Have you sufficient funds to finance the nursing program? _____

Do both parents approve of your plans? _____ If not, explain briefly _____

_____

(This form may be reproduced without permission.)

Form A. POOL OF CANDIDATES FOR ENTRANCE TO SCHOOLS OF NURSING (Copy to be forwarded to State nursing council for war service)

Name of secondary school ..... Address ..... Total number in graduating class .....

No. of pupil	General intelligence test P. R.	Rank in class	School mark average	Grade or grade average in								Percentile rank on achievement test						Physical handicaps	Has selected school of nursing	Needs financial aid
				English	Social studies	Mathematics	Biology	Chemistry	Other science	Foreign language	Home economics	Reading ability	Arithmetic	Biology	Chemistry	Other science	English			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

22. List here exact names and forms of standard tests used:

General intelligence (verbal) .....
Reading ability .....
Arithmetic .....
Biology .....
Chemistry .....
Other science .....
English .....
Other tests .....

(Instructions on following page)

INSTRUCTION SHEET FOR THE CONDENSED FORM A

1. *Number of pupil.*—Assign a number to each pupil, recording it on her folder as well as on Form A. This will conceal the identity of the individual pupil until the nursing representative arranges a meeting or other contact.
2. *General intelligence test (verbal) percentile rank.*—Record percentile rank based on college entrance norms. If I. Q. is given instead, be sure to indicate that fact with an asterisk and footnote.
3. *Rank in class.*—Enter the individual's rank in class. In the space provided at the top of the sheet write the number of pupils in the class.
4. *School average to date (in all subjects).* Enter scholastic average following custom of your school, using percent rather than letter grades, if possible.
5. *English.*—Enter grade averaged in all English work taken by pupil since entrance to ninth grade.

6, 7, and 12. Apply instructions given for 5.

8 and 9. Enter final grade in biology and chemistry, respectively.

10. Enter final grade earned by pupil in a science other than biology or chemistry, indicating by asterisks and footnotes the name of the science.
11. Enter grade averaged in the foreign language the student has studied longest since entering ninth grade. If two languages have been taken by a pupil for an equal period of time, enter the grade averaged in the language in which pupil has attained the best grade. Indicate by asterisks and footnotes the names of the languages.
13. Enter percentile rank (based on college-entrance norms) attained in Reading Ability Test.

14, 15, 16, 17, and 18. Apply instructions given for 13.

19. Indicate nature of physical handicap, disability, or defect, or state "none," if appearance or available records show no evidence of such defect.
20. *Has selected school of nursing.* Write in "yes" or "no."
21. *Needs financial aid.*—Write in "yes" or "no."
22. List under appropriate title the names of the standard tests used in determining the percentile ranks recorded in columns 2, 13, 14, 15, 16, 17, and 18. It is essential to give in each case the exact name and form of the test as it appears in print on the test used. If any of the tests recorded were administered prior to the last 2 years, the year in which each was given should be indicated either under 22 or in appropriate footnotes.

APPENDIX A. APPROPRIATE STANDARD TESTS AND SUGGESTIONS FOR THEIR USE

The tests named below are suggestions only, not recommendations. If the school prefers to administer or has already administered similar standard tests, such tests may be substituted.

A number of schools of nursing have established procedures for administering psychological tests to their applicants in order to provide a common measure for comparing them. The tests suggested below cannot in most cases be substituted for such an established program but have a preliminary use. After making application to a definite school of nursing, the student may also be required to take a set of tests that will be administered under the direction of the school of nursing.

Nursing ability cannot be predicted by any single test and various combinations of measures may be equally useful. If a single measure of probable success in nursing is all that is practicable in a school, it is desirable that the test be selected from Group I. General Intelligence (Verbal) and the results entered on Form A. If a more extensive testing program is possible, one test each from the following three groups should prove fairly satisfactory.

I. Intelligence (as a measure of ability to learn).
IIB. Arithmetic (as a basic skill in computation).
IIC. Science (as related or background information).

The foregoing plan assumes general intelligence is a fairly adequate measure of reading ability and English. However, the inclusion of tests from subgroups IIA and IID are desirable if time permits.

An alternative program is possible through a combination of a selection from Groups I and III. The batteries listed contain subtests covering reading, arithmetic, and English; certain ones have a section on elementary science. The batteries have certain administrative advantages over separates in that there is a single set of directions to be mastered, uniform norms from subject to subject, and usually some saving in time and cost.

In schools where the administration of an extensive testing program seems impracticable, the omission of the tests will not prejudice the candidate who presents otherwise good evidence of qualifications.

Detailed manuals of instruction for the tests are supplied with test booklets. Instructions for administering and scoring the tests should be followed *minutely*. Their usefulness in comparing one individual with another depends upon the faithfulness and exactness

with which standardized directions regarding the conditions of testing, time limits, and instructions to the person tested, are followed.

Some tests have several different norms with which the individual scores may be compared. The scores of applicants for schools of nursing should, so far as possible, be compared with college-entrance norms. Care in indicating the norms used should be taken in assigning the percentile rank to the individual person and in filling out Form A.

Group I. General Intelligence (Verbal)

American Council on Education Psychological Examination for College Freshmen. Washington, D. C., American Council on Education, 744 Jackson Place, NW. A new form published each year. Scoring: Hand or machine. Working time: 60 minutes.

Otis Quick-Scoring Mental Ability Tests. Gamma Test, high school, college. Yonkers, N. Y., World Book Co. Scoring: Hand or machine. Working time: 30 minutes.

Henman-Nelson Test of Mental Ability. Form C, Intelligence Test for College Students. Boston, Mass., Houghton-Mifflin. Scoring by Clapp-Young self-marking device which requires no key. Working time: 35 minutes.

Terman-McNemar Test of Mental Ability. Grades 7–12. Forms C and D. Yonkers, N. Y., World Book Co. Scoring: Hand or machine. Working time: 40 minutes.

Any other intelligence test of this type having norms for college freshmen, such as the *California Test for Mental Maturity*, the *Ohio State University Psychological Test*, etc., may be substituted.

Group II. Educational Achievement Tests (Separates)

A. Reading Ability

Iowa Silent Reading Tests, New Edition. Yonkers, N. Y., The World Book Co. Advanced Test. Forms Am and Bm. For high school and first-year college. Scoring: Hand or machine. Working time: 45 minutes.

Cooperative Reading Comprehension Tests. Test C2. Forms Q, R, and S. For use in upper high-school grades and college. New York, Cooperative Test Service. Scoring: Hand or machine. Working time: 40 minutes.

Cooperative Reading Vocabulary Test. Forms Q and R. New York, Cooperative Test Service. Scoring: Hand or machine. Working time: 30 minutes.

B. Arithmetic

Gordon-Douglass Fraction Test for Beginning Students of Nursing, Minneapolis, Minn., University Press, University of Minnesota. Scoring: Hand. Working time: 25 minutes.

Cooperative Mathematics Test for Grades 7, 8, and 9. Forms O, P, Q, RO. New York, Cooperative Test Service. Scoring: Hand or machine. Working time: 80 minutes.

C. Science

Cooperative General Achievement Tests. Revised Series. Test II. A Test of General Proficiency in the Field of Natural Sciences, Three forms. Secondary schools and college placement. New York, Cooperative Test Service. Scoring: Hand or machine. Working time: 40 minutes.

Columbia Research Bureau Chemistry Test. Two forms. Yonkers, N. Y., World Book Co. Scoring: Hand. Working time: 2 hours.

Columbia Research Bureau Physics Test. Two forms. Yonkers, N. Y., World Book Co. Scoring: Hand. Working time: 90 minutes.

Cooperative General Science Test (High School). Forms O, P, Q. New York, Cooperative Test Service. Scoring: Hand or machine. Working time: 40 minutes.

Cooperative Biology Test (High School). Forms N, O, P, Q, S. New York, Cooperative Test Service. Scoring: Hand or machine. Working time : 40 minutes.

Cooperative Physics Test (High School). Forms N, O, P, Q, S. New York, Cooperative Test Service. Scoring: Hand or machine. Working time: 40 minutes.

Cooperative Chemistry Test (High School). Forms N, O, P, Q, S. New York, Cooperative Test Service. Scoring: Hand or machine. Working time: 40 minutes.

D. English

Cooperative Mechanics of Expression Test A. Three forms. New York, Cooperative Test Service. Scoring: Hand or machine. Working time: 40 minutes.

Cooperative Effectiveness of Expression Test. Test B2. Three forms. New York, Cooperative Test Service. Scoring: Hand or machine. Working time: 40 minutes.

Group III. Educational Achievement Tests (Batteries)

Metropolitan Achievement Tests (Revised). Yonkers, N. Y., World Book Co. Advanced Battery—partial. Forms A, B, C, D, and E. Includes: Reading comprehension, vocabulary, arithmetic fundamentals, arithmetic problems, English, and spelling. Scoring: Hand. Administration time: 2 hours and 40 minutes.

Progressive Achievement Tests. Advanced Battery. High school and junior college. Los Angeles, Calif., California Test Bureau. Forms A, B, and C. Includes: Reading vocabulary, reading comprehension, mathematical reasoning, mathematical fundamentals, and language. Scoring: Hand or machine. Working time: 2 hours and 30 minutes.

Stanford Achievement Test. Yonkers, N. Y., World Book Co. Advanced Battery—partial. Forms C, D, E, F, and G. Includes: Paragraph meaning, word meaning, language usage, arithmetic reasoning, arithmetic computation, and spelling. Scoring: Hand or machine. Working time: About 1 hour and 50 minutes.

Unit Scales of Attainment. Minneapolis, Minn., Educational Test Bureau. Minimum Essentials Battery, Division 3. Three forms. Includes: Reading, arithmetic (fundamentals and problem solving), spelling and English tests. Scoring: Hand. Working time: About 2¼ hours.

APPENDIX B. ADDRESSES OF STATE NURSING COUNCILS FOR WAR SERVICE AND OF STATE BOARDS OF NURSE EXAMINERS

	State Nursing Councils for War Service	*State Boards of Nurse Examiners*
Alabama	Mrs. Walter Bragg Smith Secretary 625 South Lawrence Street Montgomery	Frances Whitten. Executive Officer. 922 Woodward Building. Birmingham.
Arizona	Minnie C. Benson Secretary 1620 Hedrick Drive Tucson	Mrs. Ella Lacy Blake. Secretary. State House. Phoenix.
Arkansas	Mary T. Wright Secretary Country Club Boulevard Little Rock	Marian E. Carpenter. Secretary-Treasurer. 516 Pyramid Building. Little Rock.
California	Shirley S. Titus Secretary 609 Sutter Street San Francisco	Helen F. Hansen. Executive Secretary. 1020 N Street. Sacramento.
California (Southern)	Stella M. Freidinger Assistant Secretary 1052 W. 6th Street Los Angeles	Helen F. Hansen. Executive Secretary. 1025 N Street. Sacramento.
Colorado	Irene Murchison Secretary 621 Majestic Building Denver	Irene Murchison. Assistant Secretary. 621 Majestic Building. Denver.
Connecticut	Margaret K. Stack Secretary 252 Asylum Street Hartford	Agnes K. Ohlson. Secretary. 220 State Office Building. Hartford.
Delaware	Mildred A. Marshall Secretary 914 Jefferson Street Wilmington	Marie T. Lockwood. Secretary. Middletown.
District of Columbia.	Edith M. Beattie Secretary 1746 K Street, NW. Washington, D. C.	M. Cordelia Cowan. Executive Secretary. 2017 S Street, NW. Washington, D. C.
Florida	Ruth Mettinger Secretary State Board of Health Jacksonville	Mrs. Louisa B. Benham. Secretary-Treasurer. Hawthorne.
Georgia	Durice Dickerson Secretary 131 Forrest Avenue, NE. Atlanta	Carrie M. Spurgeon Educational Supervisor. 111 State Capitol. Atlanta.
Hawaii		Albertine T. Sinclair. Chairman. 649 Pokole Street. Honolulu, T. H.

	State Nursing Councils for War Service	*State Boards of Nurse Examiners*
Idaho	Nellie J. Chapman Chairman St. Luke's Hospital Boise	Walter Curtis. Secretary. State House. Boise.
Illinois	June Ramsey Secretary 8 S. Michigan Avenue Chicago, Ill.	Philip M. Harman. Superintendent of Registration. State Capitol. Springfield.
Indiana	Helen Teal Secretary 1125 Circle Tower Indianapolis	Cordelia Hoeflin. Secretary. 301 State House. Indianapolis.
Iowa	Mercedes Lind Secretary Chamberlain Hotel, Room 217 Des Moines	Wavie Stiles. Executive Secretary. 17 State House. Des Moines.
Kansas	Anne Lee Wick Secretary 359 North Clifton Wichita	Cora A. Miller. Secretary. 817 State Street. Emporia.
Kentucky	Myrtle C. Applegate Secretary 604 South Third Street Louisville	Honor Murphy. Secretary. 604 South Third Street. Louisville.
Louisiana	Sadie Salmela Secretary Charity Hospital Nurses' Home New Orleans	Julie C. Tebo. Secretary. Pere Marquette Building. New Orleans.
Maine	Alice S. Hawes Secretary 54 Saunders Street Portland	C. Maude Culton. Secretary-Treasurer. 54 Saunders Street. Portland.
Maryland	Blanche G. Powell Secretary 1217 Cathedral Street Baltimore	Angela M. Shipley. Executive Secretary. 1217 Cathedral Street. Baltimore.
Massachusetts	Helene G. Lee Secretary 420 Boylston Street Boston	H. Quimby Gallupe, M. D. Secretary. State House. Boston.
Michigan	Thelma I. Scratch Secretary 51 Warren Street, West Detroit	Mabel E. Smith. Secretary. 711 Capitol Savings and Loan Building. Lansing.
Minnesota	Caroline M. Rankiellour Secretary 2642 University Avenue St. Paul	Leila Halverson. Secretary. 228 Minnesota Building. 4th and Cedar Streets. Minneapolis.

	State Nursing Councils for War Service	*State Boards of Nurse Examiners*
Mississippi	Julia S. Blue President 3209 24th Avenue Meridian	Mary Dorsey Loyacono. Secretary-Treasurer. Box 214. Greenville.
Missouri	Mary E. Stebbins Secretary 1512 Waldheim Building 6 East 11th Street Kansas City	Laura Layher. Executive Secretary. State Office Building. Jefferson City.
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Nebraska	Halcie M. Boyer Secretary 626 Electric Building Omaha	Carol L. Martin. Secretary. 1110 State Capitol. Lincoln.
Nevada	Josephine Reeve Secretary 339 West First Street Reno	Claire Souchereau. Secretary. 1134 West First Street. Reno.
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New Mexico	Fannie T. Warncke Secretary State Department of Health Santa Fe	Teresa McMenamin. Secretary-Treasurer. 417 South Arno Street. Albuquerque.
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North Carolina	Marie Noell Secretary 415 Commercial Building Raleigh	Bessie Chapman. Secretary. Box 1547. Raleigh.
North Dakota	Clara G. Lewis Secretary Capitol Building Bismarck	Clara G. Lewis. Executive Secretary. State Capitol. Bismarck.
Ohio	Elizabeth P. August Secretary 50 East Broad Street Columbus	Clara F. Brouse. Chief Examiner. 21 West Broad Street. Columbus.

	State Nursing Councils for War Service	*State Boards of Nurse Examiners*
Oklahoma	Clare M. J. Wangan Secretary School of Nursing University Hospital Oklahoma City	Jessie A. Biddle. Secretary. 531 Commerce Exchange Building. Oklahoma City.
Oregon	Linnie Laird Secretary 301 Stevens Building Portland	Mrs. Ethel Norene. Executive Secretary. 419 Pittock Block. Portland.
Pennsylvania	Katharine Miller Secretary 400 North Third Street Harrisburg	Mary A. Rothrock. Secretary. 359 Education Building. Harrisburg.
Puerto Rico		Lucila Rodriquez. Secretary. San Juan.
Rhode Island	Anna J. Delmore Secretary 42 Weybosset Street Providence	Madeleine M. Schroder. Secretary. State Infirmary. Howard.
South Carolina	Nellie S. Cunningham Secretary 306 Carolina Life Building Columbia	Nellie S. Cunningham. Secretary. 306 Carolina Life Building. Columbia.
South Dakota	Opal Sandbeck Secretary City Health Department Sioux Falls	Carrie A. Benham. Director of Nursing Education. 321 Western Building. Mitchell.
Tennessee	Lucille H. Marshall Secretary 1002 Cotton States Building Nashville	Nina E. Wootton. Secretary. 1002 Cotton States Building. Nashville.
Texas	A. Louise Dietrich Secretary 1001 East Nevada Street El Paso	Mrs. Eloween Mesch. Secretary. 609 Milam Building. San Antonio.
Utah	Vera Klingman Secretary 120 State Capitol Building Salt Lake City	G. V. Billings. Director, Department of Registration 324 State Capitol. Salt Lake City.
Vermont	Abbie L. Starkey Secretary 3 Nelson Street Montpelier	Helen L. Little. Secretary. St. Albans Bay.
Virginia	Jessie Wetzel Faris Secretary 811 Grace American Building. Richmond	Josephine McLeod. Secretary-Treasurer. 812 Grace American Building. Richmond.

	State Nursing Councils for War Service	*State Boards of Nurse Examiners*
Washington	Marian G. Kent Secretary 514 Medical Arts Building Seattle	Thomas A. Swayze. Chairman, Committee on Nurse Examiners. Department of Licenses. Olympia.
West Virginia	May M. Maloney Secretary 47 Capitol City Building Charleston	Ella Bloomheart. Secretary-Treasurer. 742 Quincey Street. Parkersburg.
Wisconsin	Edith M. Partridge Secretary 3727 East Layton Avenue Cudahy	Leila I. Given. Secretary. 353 State Office Building. Madison.
Wyoming	Louise M. Gray Secretary Natrona Memorial Hospital Casper	Ida May Oliver. Secretary. 400 East 25th Street. Cheyenne.

ADVANCE RELEASE----ADVANCE RELEASE

OFFICE OF WAR INFORMATION
WAR MANPOWER COMMISSION

Advance Release: For Wednesday Afternoon Papers, November 24, 1943

Schroeder--WMC--2036 PM-4467

As an important step in the mobilization of America's nurses for wartime needs, a nationwide registration of all graduate nurses will be conducted during the second week of February, Paul V. McNutt, War Manpower Commission Chairman, announced today.

Every graduate nurse throughout the nation is asked to register at a local hospital or health center during National Nurses Mobilization Week, commencing February 7. The appeal is being made to graduate nurses of all ages, no matter where they live or how long they have been away from active practice.

Nurses are desperately needed, according to Mr. McNutt. The shortage of nurses both on the home and fighting front, has created a serious situation that might easily become acute to the extent of interfering with the war program. It is estimated that this country has close to 400,000 graduate nurses, but only about half of them are now in active practice--with 40,000 in the armed forces and 170,000 in civilian nursing. The remainder, approximately 200,000, have given up nursing.

Under the new and approved technique for handling casualties, the number of nurses needed at the front is rapidly increasing and, as the theater of war expands, more and more nurses will be demanded by the armed forces. Since it requires approximately 2½ years before a trainee is ready for active duty, no immediate relief can be expected from the U. S. Nurse Cadet Corps.

The maintenance of health and hospital facilities on the home front is equally important to the war. War workers and those in essential civilian industries must be kept in good physical condition to keep production at a high level. Crowded cities, overtaxed community facilities, long hours and lack of recreation do not tend to improve health. Proper preventive measures, as well as actual medical service and nursing, are necessary if the health of the workers is to be maintained. Large numbers of nurses must be available. Those called to the armed forces must be replaced by nurses now inactive.

Mr. McNutt stressed the importance of utilizing in professional nursing activities those graduate nurses now inactive. He said that all graduate nurses who register during Nurses Mobilization Week will help importantly toward the attainment of this goal. Mr. McNutt expressed the hope that every nurse in the country will

(Over) X-23066

appreciate the need for her services and will offer them voluntarily for either military or essential home duty.

The registration is being held by the Procurement and Assignment Service of the War Manpower Commission to obtain an up-to-date inventory of nurses in the country. The 25,000 members of the Women's Auxiliary of the American Medical Association have volunteered to act as registrars.

Nurses

Henderson-FSA
Extension-2395

OFFICE OF WAR INFORMATION
OFFICE OF DEFENSE HEALTH AND WELFARE SERVICES

For Immediate Release
Thursday, February 11, 1943

OWI-1250

Proposal for a Victory Student Nurse Corps has been submitted to Paul V. McNutt, Federal Security Administrator, by the Health and Medical Committee, Office of Defense Health and Welfare Services, Mr. McNutt announced today. The Victory Student Nurse Corps was proposed as a means of reaching the quota of 65,000 student nurses, recently announced. This quota of nurses is needed to help meet the present critical shortage of military, governmental and civilian nurses.

Tentative provisions of the Victory Student Nurse Corps plan include a distinctive insignia, maintenance and stipends for students, and utilization of a portion of senior students in military and other governmental hospitals. The plan would be administered by the U. S. Public Health Service as an expansion of its present nursing education program. It was presented to the Health and Medical Committee, by Dr. James A. Crabtree, Executive Secretary, upon recommendation of the subcommittees on nursing and hospitals.

Included in the proposal is the condensing of the required training period for student nurses from 36 months to 30 or 24 months. Maintenance would be provided throughout the training period. Any student enrolled in a participating school of nursing after January 1, 1941 would be eligible to volunteer for the corps. Members would agree to serve wherever needed for the duration of the war and six months thereafter.

Upon graduation, nurses would either enter the armed forces with full rank and pay of Second Lieutenant or Ensign, or would be assigned to governmental or civilian nursing services essential to the war effort.

"Current aid from the U. S. Public Health Service for under-graduate nurse training is inadequate to meet wartime nursing needs," said Dr. Thomas Parran, Surgeon General, U. S. Public Health Service. "Future quotas of the Army and Navy cannot be met from the current nurse supply without a threatened collapse of nursing care for the civilian population."

Mr. McNutt who is giving serious consideration to the plan stated, "More nurses must be trained. Nurses are essential."

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ADVANCE RELEASE: For SUNDAY Papers, February 14, 1943
Henderson - FSA - 2395

Nurses

OFFICE OF WAR INFORMATION

FEDERAL SECURITY AGENCY

OWI-1270

Fifty percent of the graduate nurses of the country have returned their registration cards in the national inventory begun January 1, Paul V. McNutt, Chairman, War Manpower Commission, was informed today by the Subcommittee on Nursing Health and Medical Committee, Office of Defense Health and Welfare Services, Federal Security Agency. Mr. McNutt urged the other 50 percent to return their cards at once. The appeal was directed to private duty, institutional public health and all other nurses, both active and inactive.

"The need for quick response is urgent", Mr. McNutt declared, "because the inventory data will be utilized as a basis of operation for a nursing supply unit now being set up in the War Manpower Commission. Details of the unit are not yet developed, but it is definite that the plan will be worked out on a voluntary basis."

The survey is being conducted by the U. S. Public Health Service through deputized Special State Agents. Because tabulations of returned cards must be completed by State Deputies by March 1, Mr. McNutt said it is necessary that nurses mail their cards immediately.

"In order to make plans for meeting military and essential civilian needs, we must have up-to-date information regarding our nursing resources," Mr. McNutt pointed out. "The inventory is the simplest and most practical method of determining them."

Twenty-nine States and the District of Columbia have filed progress reports to date. Of these, six States top the list with returns from 70 to 80 percent of their nurses. They are Colorado, Connecticut, Iowa, Maine, New Jersey and Tennessee.

- 30 -

Magazine Division
Office of War Information
Social Security Building
Washington, D. C.

WOMEN IN NURSING

Nursing is one of the most critical womanpower shortages of the war. It is a shortage that has now reached a danger point; and every woman who is a graduate nurse should be convinced that it is her duty to practice her profession either full time or, if other duties do not permit, then part-time. With the Army and Navy enrolling nurses at the rate of 2,500 a month, civilian nursing needs become more and more acute...and there are nearly 60,000 women, educated for nursing, lost to service because of retirement or transfer to other activities, who could be put to work at once, or after short "refresher" courses. They are needed in:

Civilian Hospitals: At a time when hospital beds are greatly needed, many institutions have been forced to close entire units for lack of nurses to staff them. Some even face complete close-down. In others, a single night nurse may have to care for as many as forty patients, a number of them seriously ill.

The nursing schools are campaigning to enroll 65,000 new students this year; but one of the best sources of immediate help for the civilian hospitals are the women who are already trained, who can go to work right now. So great is the need that many hospitals are gladly taking nurses on half-day schedules, or even a day or two a week.

Industrial Plants: Industrial nursing has become a necessary part of war production. Many of the employees are women doing heavier-than-normal work, and older people unused to long hours and strenuous labor; they need a graduate nurse within the plant to help keep them healthy and on the job. They also need her for minor accidents which are the result of unfamiliarity with new machinery. Without the industrial nurse, the large factory inevitably will lag in production.

Public Health: Hundreds of small towns have become "big cities" in population because of in-migration of war workers; yet in many, there has been little or no increase in health facilities, and the armed forces are draining off the doctor supply. Nurses are needed as a part of the health program in these towns, if clinics are to be maintained for the protection of the population against epidemics and health breakdowns. Nurses are also needed for home visiting and in the schools of these towns.

Specialized Nursing: Mental institutions are far short of their needs for psychiatric nurses. Many health agencies are seeking nurses specially trained in maternal care and child health. Nurse-midwives are desperately needed in regions where doctors are few and distances are

great. There also is need for more nurses skilled in caring for crippled children. In addition to these specialized fields, nursing instructors, supervisors and administrators are wanted -- nurses with advanced training in teaching and supervision.

NURSING EDUCATION NOW FREE

To meet the demand for new nurses, 65,000 girls (high school graduates or those with some college training) will have to be recruited by the nurse training institutions this year. To speed up this program, and to give nursing an advantage in competition with other war industries that attract young girls because of high salaries, Federal funds have been made available for the complete training of all who can qualify for nursing courses.

Under the provisions of the Bolton Act, which was approved June 15, students taking their training in any of the institutions complying with the regulations of the Act will become members of the Cadet Nurse Corps, and will be privileged to be in uniform. As an enlistee in the Corps, the Cadet will receive training for professional nursing in one of two speed-up courses, one of 24 months, one of 30 months of intramural training, with 6 or 12 months of supervised practice. She will start as a Pre-Cadet, pass to Junior Cadet, and then to supervised practice as a Senior Cadet. She will receive free tuition, maintenance, uniforms and insignia, plus a monthly stipend of $15 for the first 9 months, $20 for the next 15 to 21 months, and at least $30 a month for the final period as Senior Cadet. In return for this free training in a lifetime profession the Cadet agrees to continue to practice nursing for the duration of the war. She is assured that her training will be completed, for provisions of the Bolton Act state that any student enrolled 90 days prior to the end of the war will be permitted to complete her course.

Uniform of the U.S.Cadet Corps, which makes nursing one of the few civilian services in uniform - includes not only hospital dress but summer and winter street uniforms: 2-piece suits, topcoats and reversible raincoats, completed by a Montgomery beret and other appropriate accessories. The Corps Insignia is the official U.S.Public Health insignia.

This material was compiled in connection with the program to promote full use of womanpower in necessary civilian jobs which is being sponsored by the Office of War Information and the War Manpower Commission with the cooperation of national magazines.

OCCUPATIONS - ' ORDNANCE + EXPLOSIVES

HER. 4060 5M 3-42
PRINTED IN U.S.A.

File Room,

HERCULES POWDER COMPANY
INCORPORATED
NEWS BUREAU
WILMINGTON, DELAWARE

NEWS—FOR PUBLICATION

On Receipt

I am sure woman editor of this magazine could give us more data if we would write

To handle an expanded research program 90 per cent devoted to the war effort, Hercules Powder Company has employed a group of women chemists and also instituted a night research shift at its central Experiment Station laboratories.

This wartime basis for chemical research operations was announced recently by Dr. Emil Ott, in whose three years as director of Hercules research its staff has been doubled and its sphere of laboratory investigation widened.

There are more than 204 trained chemists and a total research staff of more than 600 men and women now working in the 15 buildings located on a 300-acre plot of land on the outskirts of Wilmington, Del. Research expenditures at this Experiment Station in 1942 will approximate $1,500,000.

Mindful of the need to conserve building materials, no new structures are contemplated, Dr. Ott said, although the station has a high priority rating because of the nature of its war work.

To handle the staff expansion, additional laboratory and office space was leased nearby in the city of Wilmington. Then, the company decided to "double up" on operations by establishing a night research shift rather than increase the physical facilities of the station.

"We can save laboratory space and equipment by assigning about 25 per cent of our staff regularly to night research, from 4:30 P.M. to midnight, without reducing the volume or quality of results," Dr. Ott reports.

At the same time, the transfer of some men chemists to ordnance work necessitated the employment of women who have received adequate schooling to qualify them, he said.

Believed to be one of the largest groups of women chemists in any of the chemical industry's laboratories, the Hercules group of 37, many of whom are 1942 college graduates, represents a ratio of one woman to every six men chemists. With only about 300 girls graduated each June from colleges with degrees in chemistry, they also represent a ratio of one out of every ten in this year's graduate

High school girl graduates are working at the Experiment Station as laboratory helpers or in filing and secretarial posts.

Hercules also is employing women as chemists, technicians, and helpers in two of its plants, and in at least two of the ordnance works it operates for the War Department.

Included among the women chemists at the Hercules Experiment Station is Lura Shorb, who in the last war was one of the few of her sex in the chemical industry. In 1917, she was an analytical chemist at the explosives plant run by Hercules at Kenvil, N. J.; today, she is in charge of the extensive services of the technical library at the research center.

Dr. Donna Price, a Cornell graduate; Dr. Elizabeth Osman from Bryn Mawr; and Lois Hans, one of the better-known women chemical engineers in the specialized field of paper making, are also on the staff of the Experiment Station.

How are these women chemists turning out? Dr. R. W. Cairns, director of the station, sums it up:

"These young women college graduates are in exactly the same position as young men. They're cubs in the laboratory and must prove their worth. While now they need the direction of experienced research men, we have hopes that among them will be found the same degree of creative talent that we have discovered in our young men in former years."

The women chemists, he added, have displayed patience and dexterity--two key talents of the laboratory worker, who must tabulate thousands of observations with diligent accuracy, and who must at all times be careful of delicate and valuable laboratory equipment.

To secure this group of chemists, Joseph M. McVey, personnel director, began immediately after Pearl Harbor to sign up the top-notch women seniors in colleges all over the country.

They have come from the campuses of Vassar, Mt. Holyoke, Oklahoma, Delaware, Syracuse, Elmira, Drexel, Wilson, Berry, Illinois, Indiana, Northwestern, Brenau, Western Maryland, Bryn Mawr, Washington College, Dickinson, Goucher, Penn State, Bucknell, North Carolina, Hood, Chattanooga, Carnegie Institute of Technology, Willamette, Pennsylvania, Cornell, and Wellesley.

# # #

extra copies

DEFENSE INDUSTRIES: ORDNANCE

In Arsenals of Democracy, Bureau of Public Relations, War Department

ILLINOIS

The Elwood Ordnance Plant (shell-loading) being built in the country (near Kankakee) will employ between 5,000 and 6,000 men and women.

INDIANA

The Indiana Ordnance Works, being built near Charlestown in the Southern part of the State, will be operated by E. I. DuPont de Nemours & Co., and will produce smokeless powder. The plant will employ 1,450 skilled men, 5,500 unskilled men and 1,800 women. The Hoosier Ordnance Plant (bag-loading) being built near the power plant will employ 750 skilled men, 1,200 unskilled men and 1,800 women.

MISSOURI

Between 10,000 and 12,000 persons will be employed in the St. Louis Ordnance Plant in the manufacture of small-arms ammunition.

Superfine Shell Fuzes Made To Music by Singing Girls

No Grimness in Assembly Lines That Are Speedier Than Expert Watchmakers

(First of a Series.)

By THOMAS R. HENRY,
Star Staff Correspondent.

A UNITED STATES ARMY ORDNANCE ARSENAL, April 4.—It is no secret that the Army has a shell time fuze whose mechanism is essentially that of a superfine watch with an accuracy of a 400th of a second.

It has more than 100 separate parts. Some of them have a size tolerance of only ten thousands of an inch. The motivating power is centrifugal force. Its tiny brass wheels start turning when the shell in which it is placed leaves the gun muzzle at a certain number of revolutions a second. Exactly on the mathematical split second when it is calculated the target should be reached the "watch" sets off a detonator and the shell is exploded.

Basic Idea German.

The device is a miracle of mechanical ingenuity and precision. The basic idea came from a German patentee back in 1924. It was crude and unworkable. Without the split-second accuracy it would be useless. It had to be absolutely reliable and absolutely foolproof. Army ordnance engineers worked over the clumsy German idea until it was so perfect that "a shell could think for itself."

This watch must be tough. It must stand the test of being thrown with terrific force against a theoretical brick wall once a second for four hours. Then it is shaken violently in a shaking machine for eight hours. Then it is dropped on an iron plate from a two-story window. If it still keeps time within 400th of a second accuracy after this it is ready to be placed in an anti-aircraft shell. Otherwise it is melted back into scrap brass and the whole process starts over again. Very seldom is it necessary to reject one.

But, having perfected the mechanism, the ordnance engineers were only at the threshold of their real problem. The device contained parts practically indistinguishable from those upon which skilled watchmakers spend hours of incredibly patient, microscopic work. There are not enough watchmakers in the world to produce the timers in quantities sufficient to be of any real significance in modern warfare.

Turned Out by Thousands.

Today at this arsenal they are being turned out by the thousands each day and the workers are not skilled watchmakers. They are, for the most part, girls who graduated from high school in the past two or three years. They are mostly girls who never did a day's work before. They have learned their crafts in, at the most, a couple of months. They are doing their jobs much faster and more accurately than these could have been done by expert mechanics with old methods.

This, rather than the time fuze itself, is the real miracle, perhaps tantamount to a major American victory. The scene is one of the inspiring sights of the war, and these high school girls in their blue and white uniforms almost as truly soldiers in battle as the men in Iceland or Australia. And they know it. They were selected because they have—perhaps to a greater degree than any other class of American citizens except the blind, who are being used elsewhere on similar jobs—nimble and sensitive fingers which enable them to detect minute differences with lightning speed.

The miracle was achieved by the Army ordnance engineers in the only way imaginable—setting up an assembly line and introducing the methods of mass production. But mass production of the most delicate kind of watch and of an automobile are altogether different in practice. It depended primarily on producing tools—dies, drills, stampers, etc.—which were absolutely accurate and foolproof, each suitable for one specific job, and one only. For the more than 100 parts there are about 800 distinct operations, each performed by a different tool. Add to this fingers nimble enough to pick up pins all day long and the problem is solved. They started with men. These men are being moved to other arsenal jobs as rapidly as possible. Compared to high school girls, even mechanics skilled in handling fine parts are clumsy.

Assembly Line Humanized.

Even in far cruder, slower industries the assembly line has been criticized for being inhuman. For this particular job the charge might well be true. That it is not is the third miracle accomplished by the fatherly, intensely human general commanding the arsenal and his staff officers and superintendents. He has humanized the assembly line as it never has been humanized before and there is no likelihood that any girl ever will be carried in screaming hysterics from this most exacting of all such lines.

It depends on hundreds of little things introduced here and there. The conveyor belts, for one thing, not move at too fast a pace. This actually saved time, for it prevents bottlenecks. Another factor is the music. There are phonographs playing frequently throughout the day and the girls bring their own records. The other afternoon the fuses were being put out to the rhythm of "Beautiful Dreamer," whose timing is about that of the conveyor belts.

Production went up about a thousand a day, the general says, after the music was introduced. The girls constantly are singing as their nimble fingers manipulate the delicate pieces. The weird bluish light from the fluorescent lights falls on long rows of pretty young faces always smiling. This is a strange contrast to the grim faces of women working on assembly lines in some converted industries.

Blue and White Uniforms.

The uniforms help. There are blue ones for the three-month veterans, white ones for the learners. These girls look on themselves as soldiers and their job as an engagement with the enemy.

The time in which some of the most delicate jobs are done, compared to the time taken by expert watchmakers on a semi-mass-production basis, is almost incredible. There is one part assembly which could be fitted by the best men with years of training at a rate of 50 assembles a day. One girl here turns out 400 assemblies a day. There is another part which can be adjusted by an expert jeweler at a rate of 75 a day. One girl does it at the rate of 1,300 a day, and keeps singing and smiling. Still another job requires two watchmakers eight hours to do about one-eighth the work a single girl does in eight hours.

Some of the parts to be adjusted are barely large enough to be seen with the naked eye. A watchmaker would use a magnifying glass. But these girls have sharper eyes. With lightning speed their fingers manipulate these specks of brass. They drill holes in brass with an accuracy of 100th of a millimeter, but this is no trick for the girls. The drill they use cannot do anything else. They learn to operate gauges with a fineness of a ten-thousandth of an inch.

The Army doesn't try to regulate the lives of these girl soldiers on the front lines of democracy, largely through whose work many a German and Japanese pilot already has bit the dust. Outside working hours they do as they please, but every precaution has been taken in organizing the assembly line so that they will not be too tired to do anything but sleep when they leave the arsenal.

Any old pre-war maps of Europe lying around your house? The Government needs paper.

Brand N ular Style

Employment of Women in the Manufacture of Cannon & Small Arms in 1942 –

Margaret Kay Anderson

Canada – 60–75% W. in small arms & cannon mfg.
Estimate U.S. may reach 75% in small arms; 40% Canada

More W. on milling machines than on others – 35% in 1 plant
In Canada 760% milling mach. op. = W.
Many on drill presses – 80% in 1 plant

p. 11 – break down on grinding pp. 2–3 – p. 15
17 – Assembly
p. 20 – women on gage inspection – math. – lab.
p. 22 ; p. 28

Wage rates – p. 29 – 3 out of 8, equal pay principle

Homes
p. 31 –
p. 32 – women in personnel relations – – – inn forms
p. 34 – food service

GOVERNMENT ARSENALS

Busy at Arsenal

(In Philadelphia, Pa., News, October 18, 1940)

Philadelphia. -- Defense work is rushed at Frankford Arsenal. Woman worker calibrates 155-mm. shells for hairline accuracy. Woman feeds .50-caliber cartridge cases into machine that tapers them for use in modern antitank guns. Production is at capacity. (Pictures).

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Women Assist National Defense

(In Washington Post, December 27, 1940)

Philadelphia. -- Women numbering approximately 3,500 are now working in the Frankford Arsenal, Philadelphia, and their number is increasing. Classified under Civil Service as semiskilled workers, they are employed on machines turning out 30 and 50-caliber cartridge cases. (Pictures).

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Women's Work Plentiful at Kingsbury Shell Factory

(In Muncie, Ind., Press, January 8, 1941)

Kingsbury, Ind., Jan. 8. -- (AP) -- Women will assume an important role in operations of the Kingsbury ordnance plant, which probably will begin assembling 170,000 minor calibre shells daily by next October.

Of the 6,000 workers to be employed in the plant, which will be situated on a 13,200-acre preserve in LaPorte County, approximately half will be women.

Army experts say they prefer women to work on the assembly lines, explaining the tasks are light and clean but require efficiency and speed. . . . . .

The specific purpose of this project is the assembling of small cannon ammunition, parts for which will be made in other sections of the United States.

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OCCUPATIONS

ORDNANCE + EXPLOSIVES - 1940

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NATIONAL DEFENSE: Gas Masks for the Army and Civilians

(In Daily News, N.Y. City, February 15, 1941)

Edgewood, Md. -- Some of the steps in the manufacture of gas masks at Edgewood Arsenal, Edgewood, Md.:

1. In making the mask, the first step is the blanking (stamping out) of the face piece. Sheet rubber, lined with stockingette, is the material that is used.

2. Gaskets are cemented over the holes in the face piece, and into these are inserted the lenses. Plastics have replaced glass to reduce possibility of shattering.

3. A man tightens the eye rings, then passes masks to a woman. Her job is to test the eye piece assembly under air pressure to insure that the lenses are tight.

4. Every seam is cemented and masks are baked in an oven. Women take them off this endless belt and rub the seams smooth to make a perfect seal.

5. To the face piece is attached a hose and cannister (containing chemicals to remove toxic vapor molecules from the air). The soldiers are learning manufacturing methods so they can make emergency repairs in the field.

6. The finished masks are stored away in air-tight containers for use whenever the occasion arises. The cans are soldered, then they are placed under water and tested. The mask produced in this plant is rated one of the best of its kind in the world.

7. The present mask is very light, and the canvas holder fits snugly under left armpit, instead of being slung across the chest. (Pictures).

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This Work Must be Perfect

(In Mirror, N.Y. City, March 2, 1941)

Edgewood, Md. -- Women at the Edgewood, Md., arsenal fix mouthpieces to almost completed gas masks. This work must be completely accurate for a leak in the mask might mean death to the wearer. (Pictures.)

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Sister Susie's Sewing---but Not Socks for Soldiers

(In Ledger, Philadelphia, Pa., March 6, 1941)

Philadelphia. -- Woman---knitter of afghans, rocker of cradles and crooner of lullabies---is now making mechanical time fuses for use in anti-aircraft ammunition at the Frankford Arsenal.

Her fingers are nimble, co-ordination between eye and hand exact, and routine work through the centuries has adapted her to the monotony of meticulous, repetitious work.

The mechanical time fuse, an addition to the ammunition of the army and navy since the last war, resembles a watch or clock.

It may be set at a certain time, depending on the destination of the target. Atmosphere has no effect upon it, and, as the power of motivation of a shell is controlled by the amount of oxygen in the air around it, explosion at any height may be thus regulated.

For the last two years, prior to defense, 100 women were employed in making mechanical time fuses, which require the technique of a watchmaker, a trade formerly occupied by men only. At the arsenal today 750 women are working in three eight-hour shifts, turning out "all mechanical time fuses possible," per Government orders.

Garbed in varied color coveralls to differentiate the departments and avoid all comparison of personal circumstances, they work beneath fluorescent lights before tray-lined benches. Here they finish intricate parts, so small they must be handled with tweezers, or operate the power-driven machines.

The plant is operated on an industrial production basis, workers receiving from $2.56 to $3.60 daily. The workers measure the perfection of their own work on individual micrometers, including such minutiae as .018 pivots, then pass them along for inspection, 97 per cent of which is also done by women at the plant.

Finally the completed fuse is tested for firing at Aberdeen, Md. Workers receive a bonus for perfect performance above a stated average, a method instigated by Brigadier General W. P. Boatwright, commanding officer at the arsenal.

Fuses are then tested in a dynamic regulating room by more women--spun at 16,200 revolutions a minute to test the time variation permitted by their potential escapement mechanism. (Pictures).

DEFENSE INDUSTRIES: ORDNANCE

WINCHESTER'S WILL USE 300 WOMEN NIGHTS

In New Haven, Conn., Journal-Courier and Times, April 17, 1941

Following Gov. Robert A. Hurley's announcement yesterday lifting the ban on women working after 11 p.m. in the Winchester Repeating Arms Co., officials of the concern estimated the emergency provision would mean a 35 per cent increase in production of cartridges for small arms.

Albert P. Snyder, superintendent of personnel, said production at the plant now averaged 11,000,000 cartridges a week. A new shift of 250 to 300 women working from 11 p.m. to 7 a.m., would boost production to 17,000,000 cartridges a week.

The company, said Snyder, was particularly desirous of establishing a night shift of women for cartridge inspection, which he termed a "natural woman's job." Men and boys had proved less capable of performing inspection functions, he said.

T. I. S. Boak, plant manager, said the matter had been under discussion for some time between the firm and the government. The new employment, he said, would be in the manufacture of centerfire cartridges for the British Purchasing Commission. Preparations are now being made to add the new shift.

Gov. Hurley announced at his press conference yesterday that the company had been granted permission in a telephone request made by Robert P. Patterson, assistant secretary of the U. S. War Department, who reported the production of small arms ammunition, as manufactured extensively in Connecticut was far behind schedule.

The govenor told newspapermen that production at the Winchester plant had been hampered by the 10 p.m. limit for women. By waiving the statute, he said, it would be possible to release women for night work on certain types of jobs that could not be done so well by men.

Under the gubernatorial order the use of women in the plant would be restricted to inspecting, gauging and loading in the manufacture of small arms, center fire, and ammunition for military and defense purposes.

Winchester's, authorized by a special permit issued by the State Labor Department, has been employing women until 11 p.m., an hour over the limit.

Gov. Hurley said if deemed necessary, similar permission would be given the Remington Arms Co. of Bridgeport, under an emergency provision of the State law, which allows the governor to take exception to the 10 p.m. deadline for female employment.

The Winchester and Remington Companies are two of the biggest small arms manufacturing concerns in the United States. The Winchester Company also has orders for the new Garand rifle.

DEFENSE INDUSTRIES: ORDNANCE

In Arsenals of Democracy, Bureau of Public Relations, War Department

ILLINOIS

The Elwood Ordnance Plant (shell-loading) being built in the country (near Kankakee) will employ between 5,000 and 6,000 men and women.

INDIANA

The Indiana Ordnance Works, being built near Charlestown in the Southern part of the State, will be operated by E. I. DuPont de Nemours & Co., and will produce smokeless powder. The plant will employ 1,450 skilled men, 5,500 unskilled men and 1,800 women. The Hoosier Ordnance Plant (bag-loading) being built near the power plant will employ 750 skilled men, 1,200 unskilled men and 1,800 women.

MISSOURI

Between 10,000 and 12,000 persons will be employed in the St. Louis Ordnance Plant in the manufacture of small-arms ammunition.

OCCUPATIONS

ORDNANCE & EXPLOSIVES - 1941

Feb. 17-18, 1941

WOMEN IN THE MANUFACTURE OF EXPLOSIVES

Women workers are expected to constitute half the work force in 10 new munition plants, now being constructed (Feb. 1941) by the government. Much in demand in factories making explosives during World War I women were universally successful in such occupations, both in this country and in Great Britain, even though only small numbers of them have been engaged in peace-time production of explosives.

STANDARDS FOR SAFE EMPLOYMENT

I. The Processes Employing Women in Plants Making Explosives Have Proven Extremely Hazardous, But There are Well-Defined Methods to Reduce Danger.

Smokeless Powder, its Manufacture and Use
Loading Trinitrotoluol (TNT) Into Shell Bodies
Handling of Fulminate of Mercury
Tetranitranilin (TNA)
Tetranitramethylanilin (Tetryl)

II. Hazards from Explosion Should be Carefully Guarded Against.

III. Basic Standards Have Been Worked Out for Safe Manufacture and Handling of Explosives.

World War I Regulations in Principal Manufacturing States
Standards for Employment of Women in British Munitions Work

MEP:tvw
10-16-51

EXPLOSIVES MANUFACTURE

The explosives industry already has increased production about a third since outbreak of war in Europe. 1/ The probabilities as to women's work in these plants are indicated by the situation in an earlier day.

The response to European demands for war-time explosives in 1917 meant the rapid growth of industries that proved extremely hazardous to the health of employees in some of the processes, more so for women than men. To aid in preventing repetition of these the Women's Bureau has planned to present data on the subject as a basis for further exploration. Scrutinizing the dangers involved and listing in simple form the necessary standards to prevent the occurrence of industrial illness and accidents to women will serve as a guide to their safe employment in this highly important defense industry.

After the first draft of men into the army and navy in 1917 women made up nearly 14 percent of the working force in a representative group of explosives factories, and after the second draft the percentage rose to over 23 in the same plants. In one plant engaged in loading explosives into the metal shell cases, and having a peak employment of 6,500, about 80 percent of the manufacturing employees were women. Nine plants substituted 4,854 women for men on various operations involved in the manufacture of smokeless powder. Close to 10,000 women were engaged in the loading of explosives in plants in which the work was new. 2/ In the peacetime production of explosives in 1919 only 190 women were among the 9,249 wage earners in the industry, in 1929 the 5,614 wage earners included 320 women. 3/

Protection of workers in these industries involves two problems, (1) protection against poisonous substances or unhealthful processes and (2) protection from explosions. The new plants being built are using a practice of construction now fairly well established as best in order to guard against the

latter danger; they are building in small units well separated from each other, the entire establishment located in a non-populous area.

Regulations applying to the employer should be supplemented with intensive training of the new worker in the industry. The worker herself must know the health hazards of the materials she uses, the dangers inherent in processes she works with, so that she may cooperate intelligently with the safety rules of the establishment. The publication of these standards for the employment of women in the explosives industries will serve an educational end in training programs for young women.

I. Processes Employing Women in Plants Making Explosives Have Proven Extremely Hazardous, But There Are Well-Defined Methods to Reduce Dangers.

Women have been employed in many occupations of varying grades of skill, frequently with explosives of great sensitivity and having properties hazardous to health. Processes used in the manufacture of the following explosives, four of which are discussed here, were described as woman employers by investigators during World War I:

Smokeless powder

Trinitrotoluol (TNT)

Tetranitranilin (TNA)

Tetranitramethylanilin (Tetryl)

Fulminate of mercury

SMOKELESS POWDER, ITS MANUFACTURE AND USE

Smokeless powder, a propellant the explosion of which drives the projectile from the gun, was the explosive produced in greatest quantities in the United States during World War I. New plants are now being established by the government for its manufacture. Women have been engaged to a large extent in making it, in loading it into bags for transportation, and in loaking it into the metal bodies of shells.

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LOADING SHELLS WITH TRINITROTOLUOL [4]

Occupations performed in filling the metal bodies of shells with TNT have employed many women. For example, women clean the threads of the shell to remove grains of explosive, and they measure and shellac the booster cavity. These operations are done in rooms separate from the pressing, which is a dust-producing process done by men.

TNT is very powerful and may cause particularly dangerous forms of poisoning to the worker unless every point of contact is fully guarded to prevent touching the material itself or directly encountering either dust or fumes arising from it. In most industrial processes women in larger proportions than men are very youthful. That young persons are far more susceptible to TNT poisons than those who are older, has been demonstrated in both American and British experience.[5] In England, where more women have been employed in work with TNT than in this country during World War I, mortality was greater among women than men. This was believed due in large measure to their youth. The women reported died in about 29 percent of the cases as compared to 20 percent of the men.[6]

Women ~~xxxwxxx~~ in this country dip the pressed charges in melted paraffin and make the final inspection. In the inspection the paraffined charge is weighed. If it is found too heavy, part of the paraffin must be scraped off and with a knife or scissors enough triton is then cut away to make the weight correct. Girls doing this work, in spite of heavy gloves and personal cleanliness suffered from poisoning from the slight amount of dust encountered.

TNT was little known before World War I and its manufacture was considered safe from hazards of poisoning. One American company had manufactured TNT for a number of years and by strict supervision of the physical condition of workers, by controlling dusts and fumes had had no serious case of toxic jaundice and no deaths.[7]

It was not until serious illness appeared among the men and women handling TNT in wartime manufacture that information became available about the causes and remedies for its disastrous effects. The skin is probably the most important means of entry for trinitrotoluol although respiratory contact is also important. It has been demonstrated that more is absorbed when the poison enters through the skin than when it enters the digestive tract. Consequently hot weather greatly increases the incidence of poisoning.[8/]

In the filling, pressing the charges is a dust producing process, and molding them a fume producing process, both of which are performed entirely by men.

Nitrating toluol and the subsequent separation and purification of crude TNT also has been altogether the work of men in the United States. In England the employment of women handling TNT was more common, and girls performed an extremely dusty process of hand sifting of TNT powder, not used in American factories.[9/]

TNT poisoning has many manifestations. The most serious are characterized by jaundice or anemia. In some cases women employed weighing TNT for shells suffered from the condition known as toxic jaundice.[10/]

TETRANITROMETHYLANILIN OR TETRYL[11/]

Work with this detonator causes a mild dermititis, becoming more severe for some workers, with swelling and itching of the face. An American physician describes the effects, including sneezing, nosebleed, and in some cases cessation of menstruation of one to three months' duration. Even mild cases suffer some conjunctivitis and irritation of the nasal membrane. Large numbers of women have worked with this substance in Great Britain. In one factory studied by Dr. Enid Smith almost all the 250 women so employed had suffered some type of dermatitis caused by the tetryl.

FULMINATE OF MERCURY

Another common exposure to women in ammunition manufacture is that of mercury fulminate. It is rapidly being replaced by tetryl and lead azide. Because of the highly explosive nature of the fulminate strict observance is given to avoidance of dust, scrupulous cleanliness, and a separation of processes, all of which decrease the risk of exposure. Fulminate of mercury is a very decided skin irritant and may cause a severe case of dermatitis. Particles may get into small cuts or abrasions and cause small, very sore, ulcers. Applicants for such work should be free from skin diseases, and workers should observe strict rules of cleanliness.

1/ Vocational Trends, Feb. 1941, p. 12

2/ U. S. Women's Bureau Bul. #12, pp. 62, 122, 147

3/ U. S. Census of Manufactures

4/ Called also triton and TNT in the United States, and trotyl and TNT in England. The description of process and hazards used here is based on B.L.S. Bul. No. 219. Ibid. P84 ff.

5/ Alice Hamilton. Industrial Poisons in the United States 1925. pp. 12,13

6/ Ibid. p. 11

7/ B. L. S. 219, p. 44

8/ Ibid. p. 43

9/ Ibid. p.44

10/ Ibid. p. 38

11/ See Hamilton, cit.

MEP:tvw
10-1-51

WOMEN MAKING EXPLOSIVES IN WORLD WAR II

1. Women's Employment in Manufacture of TNT
(A well-rounded summary of wartime conditions, 1943. Would be useful in a small bulletin.)
Description of Processes
Occupations Suitable for Women
Hazards of TNT Manufacture, Preventive Methods

2. Employment of Women in Ordnance in World War II
(Wartime and early postwar employment, from War Production Board Form 782.)
Brief Paragraph (Ordnance plants)
Fuller Data (Ammunition plants)
Table Showing Details

3. The Exposure of Women to Industrial Health Hazards in War Plants in A Large Industrial State, 1942
(The occupational hazards section of a N.Y. wartime state industrial study, Bul. 197.)
Effects of War Conditions on Industrial Health
Potential Exposure of Women
Systemic Poisons
Dermatitis Producers
Respiratory Infections
Other Exposures

4. Women in Manufacture of Explosives
(Brief pages planned for popular leaflet, 1941.)
Processes Employing Women
Hazards
Basic Standards for Safe Handling

MEP:tvw
11-1-51

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

WOMEN'S EMPLOYMENT IN THE MANUFACTURE OF TRINITROTOLUENE (TNT)

January 1943
(Recopied October 1951)

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WOMEN'S EMPLOYMENT IN THE MANUFACTURE OF TRINITROTOLUENE (TNT)

Until recently women have been employed in plants manufacturing TNT only in office work in the main administrative area of the plant or as nurses and medical technicians in plant hospitals. Their employment has already expanded along related lines of work. Girls are replacing young men as escorts to accompany visitors from one administrative building to another. Women are now doing clerical and semi-clerical work in receiving and stores departments located in the manufacturing area but separate from any buildings where acids or TNT are actually handled.

In addition to these employees of the company, the Ordnance Department employs inspectors to guarantee a product of specified quality. Women are now at work as inspectors, both in the mail house where inspection of the TNT is made and in the box factory where wooden boxes are cut out and assembled.

Conditions of manpower shortage in areas where TNT manufacturing plants are located necessitate careful consideration of the possibility of further placement of women. Plants report turnover, largely due to Selective Service demands, of 10 to 12 percent a month. Substitution of women who can be drawn from the locality of the plants would also relieve increasingly difficult housing situations. Family dwellings are more scarce than other living facilities.

Study was made of processes and occupations to determine whether women could perform the various duties, the extent of training that would be required, changes in methods, tools or working conditions that would make the employment of women more efficient, and the possibility of harmful effect on the health of the women in the various occupations.

TNT

SUMMARY OF OCCUPATIONS WHERE WOMEN'S EMPLOYMENT CAN BE EXPANDED

Auxiliary Departments

I - Service Department

1. Clerical workers in all divisions

2. Protection division employees
   (1) Issuing passes to visitors and checking identification
   (2) Guards manning fence watchtowers
   (3) Chauffeurs of patrol cars

3. Safety division employees
   Inspectors - about one-half of all inspectors could be women

4. Medical division

   (1) Physicians
   (2) Janitor service

5. Grounds division
   Operation of power driven farm and lawn machinery
   used for maintaining grounds

6. Yardmaster's division

   (1) Scheduling of loading and unloading transportation equipment
   (2) Chauffeurs
   (3) Truck drivers - where loading and unloading is light

7. Power division

   (1) Oilers
   (2) Firemen (automatic stokers)
   (3) Pump operators
   (4) Chlorinator control operators
   (5) Electric switchboard operator's helper

II - Maintenance Department

1. Helpers to skilled mechanics

2. Automotive mechanics

3. Machine shop work such as:

   (1) Welding
   (2) Tool crib attendant
   (3) Equipment insulators
   (4) Instrument and scale mechanics
   (5) Oilers

III - Laundry

Operatives throughout laundry

IV - Laboratory work

1. Laboratory testing

2. Bottle washing

V - Box Factory

1. Cutting boards to size

2. Printing machine operator

3. Box assembly machine operator

Production Departments

I - TNT Area

1. Weighing and packing operators

2. Nail house operators

(1) Glueing paper flaps
(2) Nailing covers - operation of nailing lids by machine
(3) Fastening metal strips around boxes

II - Acid Area

Converter operator and helper

Compressor operator and helper

Nitric acid concentration operator and helper

Sellite house operator

PART I - DESCRIPTION OF PRODUCTIVE PROCESSES

The productive processes involved in TNT manufacture have two main divisions: First, the making of strong nitric acid from anhydrous ammonia acted upon by sulphuric acid; second, the nitrating of toluene with the mixed acid to make TNT. The first process is carried on in the Acid Area, the latter in the TNT area. One plant will have several acid lines in the area and possibly six times as many TNT lines in the TNT area.

Acid Area

The main purpose of this area is to produce strong nitric acid. The operations are continuous from the unloading of the anhydrous ammonia as it is received in tank cars to the final mixing of the strong nitric acid with sulphuric acid for shipment to the TNT area. As anhydrous ammonia is received it is unloaded to storage tanks from which it can be piped as needed to the Oxidation House.

In the Oxidation House the ammonia vapors are mixed with preheated air and forced through a platinum screen which acts as a catalyst. Vapors so produced then go through absorption towers and condensers forming a weak nitric acid - about 60 percent.

From the Oxidation House the weak acid is piped to the Mixing Plant (weak) where sulphuric acid of specified weight is added and the mixture pumped to the Tower - Cascade House.

In the Tower-Cascade House the mixed acid is heated in a cracker of boilers. The nitric acid vaporizes at a lower temperature than the sulphuric. The vapors flow through an absorption tower and into a condenser. The sulphuric acid, which acts as a catalyst and dehydrating agent, is sent to the Drum Concentration House and the strong nitric acid to the Mixing Plant.

The strong nitric acid is mixed with sulphuric acid in the Mixing Plant and then loaded into tank cars to go to the TNT area.

The sulphuric acid from the Tower-Cascade House and waste sulphuric acid from the Recovery House on the TNT lines are received in the Drum Concentration House to be strengthened for re-use. The waste acid is run into an oil-fired boiler and part of the water boiled out. The exhaust vapors leaving the boiler go through an electric precipitator and any acid in the vapors is caught.

TNT Area

Production of TNT is accomplished by nitrating toluene with a mixture of nitric acid and sulphuric acid. Production is continuous as in the acid area. Its manufacture takes place in four operations:

In the first, toluene is nitrated by means of a mixture of nitric and sulphuric acid at a temperature of 35 - 40°C. The mono-nitro-toluene resulting is nitrated again yielding dinitrotoluene. A third nitration yields a mixture consisting of trinitrotoluene and small amounts of oxidation products. In the final operation the crude TNT is purified by contact with sodium sulphite.

Toluene, purchased already prepared, is pumped from tank cars to storage tanks and drawn off as needed. The first nitration is made in the Mono House. From the Mono House the charge is blown to the Bi-Tri House, while the used acid is sent to the Recovery House.

The final stage of nitration offers most difficulty. Fuming sulphuric acid is added to the bi-oil; then the mixed acid from the Acid Line is started. The temperature is increased gradually to about 180°F. After nitration is completed, the charge is cooled and allowed to settle. The spent acid is drawn off to the Fortifying House; the tri-oil is sent to the Wash House.

The crude trinitrotolune is run into neutralizing tubs when it arrives at the Wash House. The neutral TNT in the form of oil is pelleted by being run into cold water. These pellets are melted and run into crystallizing kettles where the TNT is deposited on the sides in the form of crystals.

When purification and crystallization are complete the TNT is deposited through a chute into paper lined wood boxes. From there the boxes are sent by conveyor to the Nail House where they are weighed, sealed and loaded on trucks.

In the Recovery House spent acid is run through a system of towers to separate the nitric acid from the sulphuric. This nitric acid is used for fortifying mixed acids. Waste sulphuric acid is pumped to the Drum Concentrator House on the Acid Line to be strengthened.

The process of fortifying the waste acid from one nitration with an additional amount of nitric acid so that it can be used for another nitration is performed in the Fortifying House. The mixed acid received from the Acid Line is first used in the trinitration process. It is fortified and reused in the bi-nitration, refortified and used in the mononitration. From here it goes to the Recovery House.

DESCRIPTION OF AUXILIARY DEPARTMENTS

Administrative

Box Factory

Wooden boxes for packing TNT are manufactured in this factory.

Laboratory

Chemical control tests and necessary chemical research is the function of the laboratory division.

Maintenance

The maintenance department takes care of machine, equipment and building maintenance.

Power House

Produces power and heat for the plant.

Protection Department

Provides police and fire protection.

Sellite Plant

Makes solium sulphite used in the purification and crystallization of the TNT after the washing.

Service Department

Under this department is included the Dafety Division, First aid care, Medical Division, the laundry, and janitorial work.

Waste Water Plant

Waste water from the TNT lines is processed to remove and destroy any TNT that might still be present.

Water Plant

Maintaining flow of water for the washing operations in the manufacture of TNT is in charge of this plant.

Direct production - TNT and Acid Areas - requires about half the total employees in a plant manufacturing this explosive. Expansion of women's employment should be considered both in auxiliary departments and in direct production. We discuss first the work of auxiliary divisions as to their suitability for woman employment since it is here that the greatest number of women can be used.

PART II - OCCUPATIONS SUITABLE FOR WOMEN

AUXILIARY DEPARTMENTS

Service Department

The use of women clerical workers can be expanded not only in the Administrative Department but in the Service Divisions and other branches of the plant.

In the Protection Division girls can and no doubt soon will replace many of the men whose duties are principally issuing passes to visitors and watching the long line of fence that surrounds the reservation. A staff of armed men will always be necessary but they can be greatly decreased in number. Over 400 men may be required in the protection division of such a plant. Of this number well over half could be women. Where gates are guarded by two policemen, one woman could be employed. Watch towers can be manned by women with male police on call in case of trouble. Patrol cars can be driven by women.

In the Safety Division of the Service Department there is possibility of replacing a few men with women. In addition to the safety engineers whose work is professional and highly technical, inspectors are employed who do not have a technical engineering background. These inspectors must be well versed in productive processes of the plant to do a good job. It is their work to make constant safety inspections. While some are assigned to continuous duty in certain areas most move around from one area to another. Following inspection an intelligent report of conditions and recommendations must be made. A considerable period of training would have to be allowed. With such training about half these inspectors could be women.

The Medical Division has most important functions. It must make a thorough physical examination of each new employee, periodic examinations of every employee exposed to TNT, toluol or other toxic fumes or dusts. In the case of TNT exposure such examinations should be given at least every 2 weeks. It must furnish first aid at stations thoughout the reservation and operate a hospital 24 hours a day and 7 days a week in case of emergency. Such a Division must be adequately staffed with physicians. One physician must be present at the hospital at all times. The present shortage of men physicians necessitates taking women physicians into this field. A considerable proportion of all the first aid attendants can also be women. Most of the janitor and chauffeur service required can be undertaken by women. In this

latter occupation women have proven their ability in the Red Cross Motor Corps.

The grounds division of the Service Department - maintenance of grounds area - presents quite a different picture. Practically all the work requires little skill or training and a very large proportion of the employees could be women. Driving of power operated lawnmowers and other power driven farm and garden machinery are examples of the type of work women could do. No doubt a small proportion of men will always be needed for the heaviest manual labor.

The employment of women could be expanded in the Yardmaster's Division. Similar work is handled by women in various transportation industries both in this country and in England. In general, the Yardmaster's job involves the scheduling of loading and unloading, the routing of transportation equipment including a taxi service on the reservation and from the plant to town. Women could be used as chauffeurs and truck drivers (where loading and unloading of heavy material is not involved). They can also be employed as weigh masters if state licensing regulations can be met by women applicants. The job of greatest difficulty and danger in this division is driving large trailer trucks loaded with boxes of TNT. These boxes weigh 54 lbs. Any loading or unloading would be too heavy for the average woman. The handling of large trailer trucks with such a cargo does require careful training.

Employment in the Power Division could be opened to women since much of the operation is automatic and does not require great strength. Jobs that women could do without lengthy training include oilers, firemen, pump operators and chlorinator control operators. Operation of the electric switchboard is highly responsible work and training and experience would be a necessity. A woman could be employed as assistant to the chief operator.

Maintenance Department

Many of the maintenance jobs require experience and a high degree of skill. Such are the electricians, carpenters, millwrights, lead burners and pipefitters.

These skilled men would be very hard to replace. However, there are categories in which women could be employed. Some of these would be helpers to the skilled mechanics. Women automotive mechanics are being trained by the Red Cross Motor Corps and no doubt women could be trained to maintain and repair trucks, tractors and station wagons used on a TNT reservation.

Much of the maintenance work is done in the machine shop. A difficulty in training women for the machine shop work is that so large a part of it is repair work to fill some specific need. Each job may be different from the last and machines may need to be re-set for almost every job. Without considerable training and experience women could not work independently in these jobs. Women could be employed in the machine shop to act as tool crib attendants.

A few could be used in welding - one-third to one-fifth of the total welders , though here again, the welders must be experienced in all types of welding - arc, acetylene, bar, spot and butt. Some of the welding is done on stainless steel, requiring special skill and experience and presenting special hazards from the point of view of fumes. Some of the material to be welded is contaminated with acids and great care must be taken in handling and welding these metals.

A few other maintenance jobs are possibilities for women. These include equipment insulators, instrument and scale mechanics and oilers.

Maintenance work may be required in any part of the reservation, so these employees may be exposed to any of the hazards of the various occupations. That they need careful safety training in all the hazards of the industry is indicated by the fact that in one company maintenance men ranked second only to workers in the TNT areas in number of cases of TNT dermatitis. Maintenance men ranked second only to one TNT area in number of acid burn cases, and second again to TNT area workers in acid burns of the eyes.

LAUNDRY

A laundry must be maintained to provide the clean uniforms and towels that are furnished to production employees daily. Women could do practically all the work of laundry operation as they do in outside laundries. Consideration should be given to the fact that there is some exposure to TNT dust that may cling to garments or towels. These employees should be under constant medical supervision for this reason.

LABORATORY WORK

Laboratory testing - making routine tests under supervision - and bottle washing in laboratories can well be done by women in TNT manufacture as it is in many other industries.

BOX FACTORY

Light wooden boxes of the air tight lock corner type are manufactured for the finished product. Many of the box factory jobs could be performed by women, cutting the pieces to size, printing by machine, operating box assembly machinery. These jobs are particularly adaptable to the employment of women because the factory is a separate unit not exposed to the peculiar dangers incident to work with TNT and Acids.

The Ordnance Department now has women inspectors to discard finished boxes having slivers, splits, knot holes or other such imperfections. Rest room facilities have been installed for these inspectors, facilitating the placement of women in other box factory jobs.

PRODUCTION AREAS

TNT AREA

Solely from the point of view of the physical effort required many of the jobs in the TNT Area and in the Acid Area could be handled by women. Such jobs include (1) operators and helpers in the Recovery House. Here the work requires regulation of valves to control preheating of the acid, taking observations and

recording necessary data. The operator may be called upon to make minor repairs such as the replacement of glass connecting tubes.

(2) Operators and helpers in the monohouse. The operator weighs the amounts of toluene and mixed acid to be used and controls the introduction of these materials into the nitrator. Temperature and speed of agitation must be carefully controlled during the nitration.

(3) Operators and helpers in the Bi-tri House. Here again careful control of temperature and speed of reaction is of utmost importance.

In general operators in each of these units must watch gauges and valves to control temperature and flow of materials and must watch the operations carefully to be sure nitration is proceeding normally. While the various operations are carried on in small individual houses there is close interrelation of their work. A system of signal lights indicates when the next house in line is ready for the batch.

The jobs listed in these houses on the TNT line demand individuals at least 5 feet 6 inches tall to permit easy access to gauges and easy manipulation of valves. This requirement would limit the number of women available for the work. Of even greater importance to the operation of these houses is a worker with an even stable temperament capable of acting quickly and wisely in an emergency. There are notable instances of quick action upon the part of women as well as men in emergencies but there is no mass data as to whether the proportion of women is equal to the proportion of men who may do so.

The TNT lines present special health and safety problems that must be taken into consideration if the employment of women is essential. These problems have been considered in some detail on pages 13 and 17.

Other occupations on the TNT lines seem more feasible for women. Operation in fortifying houses is one of these. It is, however, extremely hazardous from the point of view of explosions and exposure to nitrous oxide fumes. The operator is responsible for "butting up" spent acids and delivering them through the blow

case to the proper nitrating house.

Washing, melting, drying, flaking, weighing and packing of TNT requires 4 or 5 workers per shift in each wash house. The work carries with it less danger of explosion than other units on the TNT line and is considered possible for women from the point of view of physical strength requirements. One man would be needed to carry full boxes of TNT weighing 54 lbs. from conveyor to elevator occasionally. Only boxes not meeting specifications are returned in this way. The Wash House is a principal source of danger for TNT poisoning and dermatitis. The possibility of special susceptibility on the part of women to TNT fumes or dust is a principal deterrent to their employment in Wash House jobs. These occupations have had the highest rate of dermatitis and poisoning cases of any on the reservation.

Finally, the boxes of TNT go by conveyor to the nail house, the last building on each TNT line. The work of glueing down paper flaps, nailing lids by machine, and fastening metal strips around boxes is well within the physical capacity of women. Since the boxes move from one operation to another by conveyor and thus require no carrying the work could be done by women. These operations entail slight exposure to TNT. Women are at work in nail houses as inspectors of the final product. They are employees of the Ordnance Department. Provision of change house facilities for these women has been made and should facilitate the employment of women for other jobs in the area.

Acid Area

In many ways work in the Acid Area would be more suitable for women than work in the TNT areas. Most of the work is light. Most of it requires training of only a month or six weeks to six months if applicants have high school or college back rounds. As in many of the jobs on the TNT line, an operator may have to act very quickly and with presence of mind in emergencies to prevent serious accidents.

Loading and unloading of tank cars in the area calls for outside work in all kinds of weather, is heavy and poorly adapted to the physical strength of women. The cars are unloaded or loaded by means of pipes inserted into the tops of cars and operation of the necessary valves for siphoning out the liquid or pouring it in. Mixed acid operation is another job requiring climbing ladders and stairways to the top of high tanks outside in all kinds of weather.

The storage tanks must be heated to force the ammonia to the ammonia oxidation house. In this house converter operators regulate the flow of ammonia, air, steam, and water, control the temperatures and make test samples. The various gauges showing pressures and temperatures must be carefully read and recorded periodically. Compressor operators start and stop air compression in accordance with signals from the converter operator and check pressure. Women could be employed in these jobs starting, of course, as helpers to the experienced operators.

In the nitric acid concentration house fewer operators and helpers are required - about 2 of each per shift - and their work requires longer periods of training. A helper can be trained satisfactorily in about 3 months, an operator in about 6 months. The latter is responsible for the work involved in the heating by steam of mixed acids to vaporize the nitric acid. Workers control the temperatures and flows and record information. Helpers assist by going over the 5 floors of the building making recordings and adjustments and taking periodic samples from each unit in the building. Helpers take samples to the laboratory and bring back the results. Women could well be employed as helpers in these houses. Similar duties in the sulphuric acid concentration house can also be performed by women.

In the sellite house where manufacture of sodium sulphite is carried on, the situation is different. The less skilled work is heavy labor requiring shoveling wheelbarrows of sulphur and transporting them within the plant. The operator who directs the work of 3 helpers on each shift has the more responsible work and his work is not heavy. The difficulty in employing a woman for the job of sellite

operator lies in placing her over male helpers whose experience may give them seniority rights.

There is evidence that the Acid Areas are less hazardous than the TNT Areas. They have good safety records in comparison to either TNT or maintenance departments. Even danger of acid burns is greater in the early stages of nitration than in the manufacture of the acids. Fumes from sulphuric acid may be annoying and uncomfortable if atmospheric conditions prevent rapid dispersion, but they are not dangerous to health.

PART III - HAZARDS OF TNT MANUFACTURE AND THE PREVENTIVE METHODS IN USE

Recommendations for Changes in Case of Employment of Women in Production Work in TNT Manufacture

Provision of adequate medical supervision including biweekly periodic check of employees exposed to TNT should be instituted before women are employed. Appointment of women medical officers to make adequate supervision possible should be seriously considered.

Provision for nutritious hot lunch should be made.

Some special instruction should be given women in the covering of their hair to prevent carrying toxic materials home on it. Other special adaptation of protective clothing may be necessary for women.

No employee should be permitted to leave the premises without taking a complete shower bath to remove all traces of TNT from the body. Special solutions should be supplied to aid in removal. A 5 to 10 percent sodium sulphite solution is usually recommended, though acetone or potassium sulphite is sometimes substituted. In one plant sulphonated castor oil is considered preferable.

Statistical information on injuries to women with information about man hours of exposure should be kept separately from that of men to indicate any special dangers involving women.

Except for the possibility indicated by British and American authorities that women are more susceptible than men to TNT and toluol poisoning other hazards of employment would be the same for women as men.

TNT Dust

Employees in occupations in the wash house, flaking operations, boxing and weighing house and nail house to some extent the laundry and TNT laboratory are exposed to TNT dusts or vapors. The occupations with such explosure include:

Supervisors

TNT wash house operator

TNT wash house operator helper

Melt, drier, and flaker operator

Pack and weigh operator

Final pack operator

Final pack operator helper

Bottle washer in chemical laboratory

Laundry operator

There are indications that the greatest danger of TNT poisoning and TNT dermatitis are under conditions of expansion and probably to new workers. Both dermatitis and toxic TNT occur most frequently in TNT areas.

A fatal case reported by one plant, proably due to TNT jaundice, has occurred in the 9 months of that plant's operation. The young man was a wash house operator who had worked for 3 months at that occupation before his death. He had a history of previous gastric trouble but the indications were that his death was due to TNT exposure.

British authorities reported more than twice as many TNT jaundice cases and 3 times as many deaths to women than men. Of 41 cases of toxic jaundice in 1941, 12 were males and 29 were females. Of these, 3 cases were fatal among males

and 9 among females. The report concludes that there is reason to believe that women have an excess susceptibility to TNT poisoning.

Considerable contact with TNT and DNT is occasioned by recovering these materials from the catch boxes after the washing process, and this process is considered one where exposure to TNT dust is most likely to occur. Although the work itself might be done by women in the wash house, in boxing and flaking processes, because of the danger of exposure to dust or vapor women should only be taken as a last resort. The possible excessive susceptibility of women should be considered. Women employed by the Ordnance Department as inspectors in Nail Houses have some exposure to TNT.

In addition to dermatitis and toxic jaundice, TNT exposure may cause toxic gastritis. Vomiting and loss of appetite are symptoms. TNT workers may also suffer from anemia and cyanosis. The cyanosis is evident, according to investigators, where there is slight exposure. The presence of cyanosis indicates that workers are receiving too much exposure and either should be removed from the work or their work conditions improved. Blood counts frequently indicate reduction in red cells and hemoglobin soon after exposure. Complete blood counts should eliminate applicants with any tendency to anemia and recheck in the periodic examination will indicate need for transferring exposed workers.

Prevention of poisoning by TNT takes several forms. Exhausting of dusts and vapor is one. TNT in bulk form will volatilize to a slight extent even at normal temperatures. TNT dusts and vapors are heavier than air and must be exhausted by down draft ventilation, clean air being brought in at the top of the room. The exhaust should be drawn through water screens in which the TNT will collect. Proper arrangement of the operations in relation to exhausts and outside ventilation are very important. Respirators are not considered advisable for continual use but are kept in convenient locations for use in case of unusual exposure. The dust collects at the edge of the respirator, and the friction of the

respirator on the face may cause dermatitis.

Protective clothing should be issued to all workers exposed to TNT dust or vapor, and are laundered daily. Gloves should not be worn as they, like respirators, have been found to be dust catchers that serve to bring the skin into closer contact with the material. Protective varnishes or creams have been found useful in some plants.

Shower facilities are important in prevention. It is known, however, that the men do not always avail themselves of the opportunity to bathe and rigid regulations to enforce bathing have not always been set up. One company provides sulphonated castor oil in all houses on TNT lines and in change houses instead of soap since it has been found to be a good agent for the removal of TNT from the skin and does not defat the skin as does sodium sulphite. Sodium sulphite, potassium sulphite or acetone are aids in washing in other TNT manufacturing plants.

If women are to be employed in places exposing to TNT dusts, clipping their hair rather short to make possible frequent washing and to prevent carrying dust home in their hair would be necessary.

A good state of nutrition is of first importance in preventing poisoning. The medical director in one plant expressed the opinion that there is no substitute for 3 good meals a day to maintain good nutritional status. Multi-vitamin tablets are recommended for distribution to the men in toxic areas twice a day. Milk has long been furnished to those exposed to TNT. At present the feeling is that there is no specific value derived from the consumption of milk though, of course, the effect on general health is helpful. In this connection the inability of the production workers in many cases to get hot midday meals should be noted. Those in rooming houses must have their lunches put up in restaurants several hours before meal time. It would seem wise to devise some system by which the productive areas could be given a well-balanced, nutritious lunch.

Medical examination is very important in preventing poisoning. The pre-employment examination is complete in all plants and designed to eliminate any with anemic conditions, respiratory infections, heart or vascular diseases, malnutrition, diseases of the liver or gastro-intestinal tract, venereal disease, or those who use alcohol. Periodic examination is made in one plant approximately every 6 weeks, in another every 3 weeks. Most authorities advise weekly or biweekly examination. First aid men may make occasional skin patch tests to indicate sensitivity to TNT.

Careful selection and medical supervision is particularly necessary because some workers will be so susceptible that even the best working conditions do not protect them.

Nitrous Fumes

The fumes of nitrous oxide constitute a very serious health hazard. Exposure causes swelling of the tissues of the lungs varying in seriousness with the extent of gassing and the adequacy of treatment. A serious case occurring in one plant visited shows the need for immediate care. Fortunately this man recovered and is now employed in clerical work where there is no exposure. He was a new worker and, anxious to prevent spoiling the batch he was working on in the mono-house, he remained at his job in the fumes rather than leave to get a respirator. He did not report to the hospital as ordered by the supervisor but went home. When he woke with pain in his chest in the night he dressed and drove himself to the hospital. His case was very serious and recovery slow. Any worker exposed to nitrous fumes should be under medical observation for a period of 12 hours at least and should be carefully watched.

Nitrous fumes may be exhausted from buildings at ground level. A more satisfactory exhaust system would require stainless steel piping to carry the

the fumes up the outside of the buildings so that people outside would have no exposure. Acute poisoning does not occur when exposure is in the open air, according to some authorities.

Rules given to workers require them to leave the danger zone immediately in case of a nitrous fume leak, to report the condition to the supervisor and not to reenter the danger zone without a gas mask.

If the worker has inhaled nitrous fumes to the extent that he has discomfort from pains in throat or chest, continued coughing, weakness, dizziness or nausea, he must be carried out in the fresh air, kept warm with blankets and a first-aid attendant called.

Nitrous fumes are a possible hazard in the mono-house, the bi-tri house, the wash house and the fortifying house.

Toluene Vapors

Toluene vapors are not only highly inflammable but the fumes are toxic. Hose respirators are available for workers in any section where escapement of toluene fumes is a possibility. Exposure to toluene fumes may be suffered by employees in the mon-house, the bi-tri house, to maintenance men in the area and in the unloading of toluene from tank cars, though this last job would be in the open air.

EXPLOSION HAZARDS AND THEIR CONTROL

Methods for the prevention of explosions are said to be highly standardized and similar in various plants. Explosion may result from the process of manufacturing and mixing acids or from the TNT itself.

Protection of employees begins with construction of the plant. Laid out in an area about 20 miles in circumference, individual units are small and the number of employees in any one unit where explosion hazard exists is strictly limited. For example, not more than 4 persons may be in the mono-house, not over 3 in the bi-tri house at any one time. These small units are protected from each

other by high wooden barricades.

Each unit is provided with chutes so that employees may leave their place of work speedily in case there is indication of trouble. These are said to have little more than psychological value.

The bi-tri house is equipped with water tanks so that if there is indication of trouble the batch can be disposed of in the water tank.

Automatic fire extinguishing systems and automatic fire alarms are installed every here and inspection is frequent. Electrical equipment, tools, and so forth, are of prescribed non-sparking materials and construction.

Regulations require the wearing of powder shoes, prohibit the wearing of wrist watches around TNT, prohibit any carrying of matches or lighters.

Employees are picked for their temperamental characteristics as well as their good general health to protect against explosion. Ability to act cooly and quickly in emergency is essential to prevent explosion and to prevent spoilage of the batch.

It is also felt important that operators in the TNT area and in some parts of the Acid area be at least 5 ft. 6 in. tall so that levers and valves can easily and quickly be reached in case of emergency. Height regulations would restrict the employment of women. Where explosion hazards are greatest, in the mono-house, bi-tri house, and acid recovery and wash houses, administrative officials agree that women should not be employed.

ACID BURNS AND THEIR PREVENTION

Acid burns are one of the most serious hazards of TNT manufacture. The danger exists principally in the TNT areas, the acid areas and to maintenance men. The largest number of cases reported in one plant occurred in the TNT area most recently opened for operation. Almost as many occurred in one acid area and among maintenance men. The three TNT areas had something less than half of all acid burns, the two acid areas accounted for about one-fourth of all burns.

In addition, acid in the eyes injured 17 TNT workers, 9 maintenance men and 7 acid area employees.

Two very serious acid burns have occurred recently in this plant when acid fumed up in the faces of two men. One wearing safety spectacles had his eyes as well as face seriously burned. The other wearing full safety goggles had his eyes fully protected. Both these cases occurred in the TNT area.

Showers are installed at convenient points wherever acid burns are a hazard so that the employee may immediately enter the shower and wash off the acid. When loading or unloading acid cars and breaking acid lines, showers must be kept running. A green light automatically indicates that the shower is running.

All workers around acids are provided with woolen suits, plus, in the winter, long woolen underwear. Cotton or other material would disintegrate completely on contact with the acid. Rubber gloves, boots, coats and helmets are conveniently available for all workers who may be required to enter a place where acid burns are particularly likely to occur. These garments, for example, must be worn, on entering the tanks in the mono-house where pressure in the glass tubes might cause breakage. Safety goggles are available but not required since they steam over and are difficult to work with.

OTHER INJURY PROBLEMS

Some outside work such as tank car unloader and mixed acid operator, requires exposure to the sometimes severe winter weather, climbing ladders and stairways that may be icy. Women could do much of this work if they are chosen for their good general health and resistance to respiratory infections.

Maintenance men may be called upon to work in almost any section and may be exposed to all the hazards of TNT manufacture. In one plant they suffered over one-fourth of all injuries that occurred in one month - a larger number of injuries than any other group classified. Of course, the dangers of their jobs would vary

greatly depending on the type of work and the area in which they are working.'

GENERAL HEALTH PROBLEMS

Change Houses

Located at convenient points, they must be equipped with showers, toilets and washing facilities, lockers, and place to eat lunch. First aid men may have their headquarters at these change houses so they can be called quickly to the scene of any accident. Some safety equipment can be kept at the houses and the first aid attendants can attend to sterilizing all personal protective devices before they are reissued to other men.

Drinking Facilities

All houses should have sanitary, angle jet fountains.

Washing Facilities

Sulphonated castor oil, cold and hot water and cloth towels of the sanitary roller variety should be available conveniently to all production employees.

Lunchroom Facilities

Facilities should be available for hot food to production employees as well as office workers.

THE SAFETY DIVISION OF A TYPICAL PLANT

Safety work in a typical plant visited is under the jurisdiction of the General Safety Committee composed of executives. This committee serves in an advisory capacity to the Works Manager on matters of safety. Carrying out of the safety program is in the hands of the Safety Division.

In each area, weekly meetings of supervisors are held for discussions of local hazards and prevention. Accident score boards are posted with the number of days the area has operated without lost-time injury. Each house posts a mimeographed sheet of safety rules. Each new employee receives a copy of the booklet, General Safety Rules, and is instructed during his training period in safety.

In addition to the safety engineer and his assistant, a number of men are trained as safety inspectors and make continual inspection of the plant for unsafe practices of any kind.

Statistical analysis of all injury cases is made monthly.

THE MEDICAL DIVISION OF A TYPICAL PLANT

At present, the Medical Division includes the Medical Director, one other physician and 8 nurses. At least 2 other physicians are needed and effort is being made to find qualified industrial physicians. Twenty-four hour medical care must be available in the hospital in addition to preemployment and periodic examination of employees.

The physical examination has been described in part on page 17. A complete chest X-ray is included in the preemployment examination.

The medical director in this plant feels that pressure for employees and the high turnover is forcing the employment of men who do not meet high standards of physical fitness.

MEP:tvw
10-29-51

EMPLOYMENT OF WOMEN IN ORDNANCE IN WORLD WAR II

CONTENT

Women Workers in Ordnance Plants in World War II

(A brief statement with no figures could be used (1) for popular purposes or (2) If it were desired not to disclose figures)

Women's Employment in Ammunition Industries in World War II

(A fuller analysis of data giving figures on employment toward the close of World War II and rapid decline shortly thereafter. A check 10/10/51 with Archives indicates these figures were declassified).

Table showing further details of wartime employment, decline, proportions of women, etc. of four industries in the ordnance group that produce explosives.

MEP:tvw
10-11-51

WOMEN WORKERS IN ORDNANCE PLANTS IN WORLD WAR II

Women were more than a third of the workers employed in ordnance plants toward the close of World War II. They were almost half the workers in small-arms ammunition and in the loading and assembly of ammunition, and over half those in artillery ammunition.

More than four-fifths of the women ordnance employees were in ammunition industries; over 40 percent of them were producing artillery ammunition.

The number of women ordnance workers declined rapidly after the war. Within a few months they were only a fourth of such employees as compared to over a third during the war. Of the decline in women's employment in ordnance almost nine-tenths was in ammunition plants.

10-11-51
MEP:tvw

WOMEN'S EMPLOYMENT IN AMMUNITION INDUSTRIES IN WORLD WAR II

~~Employment in July 1945~~

Ordnance plants employed about 316,000 women toward the close of World War II. Over four-fifths of these (More than 260,000) were in ammunition industries; more than half of them producing artillery ammunition.

Women constituted over a third of the 880,000 ordnance workers in July, 1945, and about half of those in artillery ammunition, small-arms ammunition, and the loading and assembly of ammunition.

Employment in December, 1945

In the five months following World War II, the total number of employees in ordnance plants declined by 87 percent, the number of women by over 90 percent.

The ordnance workers in December, 1945 were only 13 percent of the number in the previous July; the women so employed in December were only 9 percent of those in ordnance plants in July, 1945. These women constituted only a fourth of the December ordnance workers compared to over a third of those in July.

Of the decline in total employment in ordnance plants, 10 percent was in the ammunition industries. For women the proportion was even greater - almost 90 percent of the decline in ordnance was in ammunition plants.

MEP:tvw
10-11-51

EMPLOYMENT OF WOMEN IN ORDNANCE IN WORLD WAR II

Industry and Status	July, 1945			December, 1945			Ratio of Dec. 1945 to July, 1945	
		Women			Women			
	All employees	Number	Percent of total	All employees	Number	Percent of total	Total	Women
Ordnance 1/	880,138	315,950	36	115,839	29,108	25	13	9
Artillery Ammunition 2/	272,915	140,160	51	6,236	1,811	29	2	1
Bombs, Mines, Torpedoes	124,015	41,549	34	8,947	1,944	22	7	5
Ammunition, loading and Assembly & N.E.C.	104,237 3/	48,973 4/	47	4,258	1,060	25	4	2
Small-Arms Ammunition	64,642	30,222	47	11,670	3,211	28	18	11
4 Industries								
Number	565,809	260,904	46	31,111	8,026	26	5	3
Percent of all ordnance	64	82		27	28			
Decline, July - December, 1945								
Total ordnance - Number				- 764,299	- 286,842	37		
Percent				87	91			
4 Industries - No.				- 534,698	-252,788	47		
Percent of total decline				70	88			

1/ Include also guns and mounts, combat tanks, metal ammunition boxes, fire-control instruments, ordnance N.E.C.
2/ See W.B. Bu. 192-2 for use of TNT and Tetryl in this industry.
3/ 98,724 plus 5,513
4/ 46,605 plus 2,368

Source: Unpublished data on women furnished the Women's Bureau from Form 732 of the War Production Board and the Civilian Production Authority.

MEP:tvw
10-10-51

3. THE EXPOSURE OF WOMEN TO INDUSTRIAL HEALTH HAZARDS IN WAR PLANTS IN A LARGE INDUSTRIAL STATE, 1942

Note: Contents of this Section appears in W. B. Bul. 197 beginning on page 23

Feb. 17-18, 1941

WOMEN IN THE MANUFACTURE OF EXPLOSIVES

Women workers are expected to constitute half the work force in 10 new ammunition plants, now being constructed (Feb. 1941) by the government. Much in demand in factories making explosives during World War I women were universally successful in such occupations, both in this country and in Great Britain, even though only small numbers of them have been engaged in peace-time production of explosives.

STANDARDS FOR SAFE EMPLOYMENT

I. The Processes Employing Women in Plants Making Expolosives Have Proven Extremely Hazardous, But There are Well-Defined Methods to Reduce Danger.

Smokeless Powder, its Manufacture and Use
Loading Trinitrotoluol (TNT) Into Shall Bodies
Handling of Fulminate of Mercury
Tetr nitr nilin (TNA)
Tetr nitrometh lanilin (Tetryl)

II. Hazards from Explosion Should be Carefully Guarded Against.

III. Basis Standards Have Been Worked Out for Safe Manufacture and Handling of Explosives.

World War I Regul tions in Principal Manufacturing States
Standards for Employment of Women in British Munitions Work

MEP:tvw
10-16-51

EXPLOSIVES MANUFACTURE

The explosives industry already has increased production about a third since outbreak of war in Europe. 1/ The probabilities as to women's work in these plants are indicated by the situation in an earlier day.

The response to European demands for war-time explosives in 1917 meant the rapid growth of industries that proved extremely hazardous to the health of employees in some of the processes, more so for women than men. To aid in preventing repetition of these the Women's Bureau has planned to present data on the subject as a basis for further exploration. Scrutinizing the dangers involved and listing in simple form the necessary standards to prevent the occurrence of industrial illness and accidents to women will serve as a guide to their safe employment in this highly important defense industry.

After the first draft of men into the army and navy in 1917 women made up nearly 14 percent of the working force in a representative group of explosives factories, and after the second draft the percentage rose to over 23 in the same plants. In one plant engaged in loading explosives into the metal shell cases, and having a peak employment of 6,500, about 80 percent of the manufacturing employees were women. Nine plants substituted 4,854 women for men on various operations involved in the manufacture of smokeless powder. Close to 10,000 women were engaged in the loading of explosives in plants in which the work was new. 2/ In the peacetime production of explosives in 1919 only 190 women were among the 9,249 wage earners in the industry, in 1929 the 5,614 wage earners included 320 women. 3/

Protection of workers in these industries involves two problems, (1) protection against poisonous substances or unhealthful processes and (2) protection from explosions. The new plants being built are using a practice of construction now fairly well established as best in order to guard against the

latter danger; they are building in small units well separated from each other, the entire establishment located in a non-populous area.

Regulations applying to the employer should be supplemented with intensive training of the new worker in the industry. The worker herself must know the health hazards of the materials she uses, the dangers inherent in processes she works with, so that she may cooperate intelligently with the safety rules of the establishment. The publication of these standards for the employment of women in the explosives industries will serve an educational end in training programs for young women.

I. Processes Employing Women in Plants Making Explosives Have Proven Extremely Hazardous, But There Are Well-Defined Methods to Reduce Dangers.

Women have been employed in many occupations of varying grades of skill, frequently with explosives of great sensitivity and having properties hazardous to health. Processes used in the manufacture of the following explosives, four of which are discussed here, were described as women employers by investigators during World War I:

Smokeless powder

Trinitrotoluol (TNT)

Tetranitranilin (TNA)

Tetranitromethylanilin (Tetryl)

Fulminate of mercury

SMOKELESS POWDER, ITS MANUFACTURE AND USE

Smokeless powder, a propellant the explosion of which drives the projectile from the gun, was the explosive produced in greatest quantities in the United States during World War I. New plants are now being established by the government for its manufacture. Women have been engaged to a large extent in making it, in loading it into bags for transportation, and in locking it into the metal bodies of shells.

LOADING SHELLS WITH TRINITROTOLUOL [4]

Occupations performed in filling the metal bodies of shells with TNT have employed many women. For example, women clean the threads of the shell to remove grains of explosive, and they measure and shellac the booster cavity. These operations are done in rooms separate from the pressing, which is a dust-producing process done by men.

TNT is very powerful and may cause particularly dangerous forms of poisoning to the worker unless every point of contact is fully guarded to prevent touching the material itself or directly encountering either dust or fumes arising from it. In most industrial processes women in larger proportions than men are very youthful. That young persons are far more susceptible to TNT poisons than those who are older, has been demonstrated in both American and British experience. [5] In England, where more women have been employed in work with TNT than in this country during World War I, mortality was greater among women than men. This was believed due in large measure to their youth. The women reported died in about 29 percent of the cases as compared to 20 percent of the men. [6]

Women ~~xxxxxx~~ in this country dip the pressed charges in melted paraffin and make the final inspection. In the inspection the paraffined charge is weighed. If it is found too heavy, part of the paraffin must be scraped off and with a knife or scissors enough triton is then cut away to make the weight correct. Girls doing this work, in spite of heavy gloves and personal cleanliness suffered from poisoning from the slight amount of dust encountered.

TNT was little known before World War I and its manufacture was considered safe from hazards of poisoning. One American company had manufactured TNT for a number of years and by strict supervision of the physical condition of workers, by controlling dusts and fumes had had no serious case of toxic jaundice and no deaths. [7]

It was not until serious illness appeared among the men and women handling TNT in wartime manufacture that information became available about the causes and remedies for its disastrous effects. The skin is probably the most important means of entry for trinitrotoluol although respiratory contact is also important. It has been demonstrated that more is absorbed when the poison enters through the skin than when it enters the digestive tract. Consequently hot weather greatly increases the incidence of poisoning. 8/

In the filling, pressing the charges is a dust producing process, and molding them a fume producing process, both of which are performed entirely by men.

Nitrating toluol and the subsequent separation and purification of crude TNT also has been altogether the work of men in the United States. In England the employment of women handling TNT was more common, and girls performed an extremely dusty process of hand sifting of TNT powder, not used in American factories. 9/

TNT poisoning has many manifestations. The most serious are characterized by jaundice or anemia. In some cases women employed weighing TNT for shells suffered from the condition known as toxic jaundice. 10/

TETRANITROMETHYLANILIN OR TETRYL 11/

Work with this detonator causes a mild dermititis, becoming more severe for some workers, with swelling and itching of the face. An American physician describes the effects, including sneezing, nosebleed, and in some cases cessation of menstruation of one to three months' duration. Even mild cases suffer some conjunctivitis and irritation of the nasal membrane. Large numbers of women have worked with this substance in Great Britain. In one factory studied by Dr. Enid Smith almost all the 250 women so employed had suffered some type of dermatitis caused by the tetryl.

FULMINATE OF MERCURY

Another common exposure to women in ammunition manufacture is that of mercury fulminate. It is rapidly being replaced by tetryl and lead azide. Because of the highly explosive nature of the fulminate strict observance is given to avoidance of dust, scrupulous cleanliness, and a separation of processes, all of which decrease the risk of exposure. Fulminate of mercury is a very decided skin irritant and may cause a severe case of dermatitis. Particles may get into small cuts or abrasions and cause small, very sore, ulcers. Applicants for such work should be free from skin diseases, and workers should observe strict rules of cleanliness.

1/ Vocational Trends, Feb. 1941, p. 12

2/ U. S. Women's Bureau Bul. #12, pp. 62, 122, 147

3/ U. S. Census of Manufactures

4/ Called also triton and TNT in the United States, and trotyl and TNT in England. The description of process and hazards used here is based on B.L.S. Bul. No. 219. Ibid. P84 ff.

5/ Alice Hamilton. Industrial Poisons in the United States 1925. pp. 12,13

6/ Ibid. p. 11

7/ B. L. S. 219, p. 44

8/ Ibid. p. 43

9/ Ibid. p.44

10/ Ibid. p. 38

11/ See Hamilton, cit.

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List given by Major George D. Rogers, Ordnance Division, March 24, 1941

ORDNANCE DISTRICTS

*1. Boston Ordnance District
Room 1501, 140 Federal St., Boston, Mass.
Chief: Col. Charles H. Tenney
Exec. Off.: Lt. Col. James S. Crawford

*2. Hartford Ordnance District
95 State Street, Springfield, Mass.
Chief: Col. Frederick H. Payne
Exec. Off.: Col. Robert Sears

*3. New York Ordnance District
Room 1815, 80 Broadway, New York, New York
Chief: Brig. Gen. Samuel McRoberts
Exec. Off.: Col. John K. Clement

*4. Rochester Ordnance District
1132 Mercantile Bldg., Rochester, N. Y.
Chief: Mr. Erwin R. Davenport
Exec. Off.: Lt. Col. Roy L. Bowlin

*5. Philadelphia Ordnance District
Room 1300, Mitten Bldg., Philadelphia, Pa.
Chief: Mr. Charles J. Ingersoll
Exec. Off.: Major D. N. Hauseman

*6. Wilmington Ordnance Region
1466 Nemours Bldg., Wilmington, Dela.
Exec. Off.: Major John P. Harris

*7. Pittsburgh Ordnance District
1032 New Federal Building, Pittsburgh, Pa.
Chief: Mr. Frank B. Bell
Exec. Off.: Lt. Col. James L. Guion

*8. Cleveland Ordnance District
1450 Terminal Tower Bldg., Cleveland, Ohio
Chief: Col. Winthrop Withington
Exec. Off.: Major H. M. Reedall

*9. Cincinnati Ordnance District
Room 831, The Enquirer Bldg., Cincinnati, Ohio
Chief: Mr. Edward A. Muller
Exec. Off.: Lt. Col. Fred A. McMahon

*10. Birmingham Ordnance District
1908 Comer Bldg., Birmingham, Alabama
Chief: Col. Theodore Swann
Exec. Off.: Lt. Col. W. F. Vander Hyden

*--Now in operation

ORDNANCE DISTRICTS

*11. Detroit Ordnance District
1832 Nat'l. Bank Bldg., Detroit, Mich.
Chief: Mr. Alex Dow
Exec. Off.: Lt. Col. Richard Z. Crane

*12. Chicago Ordnance District
Room 222 309 W. Jackson Blvd., Chicago, Ill.
Chief: Mr. Frederick A. Preston
Exec. Off.: Col. Donald Armstrong

*13. St. Louis Ordnance District
935 U. S. Custom and Courthouse, St. Louis, Mo.
Chief: Col. Harry Scullin
Exec. Off.: Major Randall J. Hogan

*14. Los Angeles Ordnance Region
409 Chamber of Commerce Bldg., Los Angeles, Calif.
Exec. Off.: Lt. Col. A. R. Baird

*15. San Francisco Ordnance District
118 U. S. Federal Off. Bldg., San Francisco, Calif.
Chief: Mr. Samuel Kahn
Exec. Off.: Col. K. B. Harmon

* Now in operation

ORDNANCE ARSENALS, DEPOTS AND PROVING GROUNDS

Name	Commanding Officer
*16. Watertown Arsenal Watertown, Mass. Gun Carriages and Forgings	Brig. Gen. R. W. Case
*17. Springfield Armory Springfield, Mass. Machine Guns and Rifles	Brig. Gen. G. H. Stewart
*18. Watervliet Arsenal Watervliet, N. Y. Cannon	Brig. Gen. A. G. Gillespie
*19. Raritan Ordnance Depot Metuchen, N. J. General Supplies Storage, Ammunition Storage and Loading Plant	Lt. Col. John H. Woodberry
*20. Picatinny Arsenal Dover, N. J. Smokeless Powder, High Explosives, and Loaded Ammunition	Brig. Gen. E. M. Shinkle
*21. Frankford Arsenal Philadelphia, Pa. Fire Control Instruments, Small Arms Ammunition, and Artillery Ammunition	Brig. Gen. W. P. Boatwright
*22. Delaware Ordnance Depot Pedricktown, N. J. Ammunition Storage and Loading Plant	Lt. Col. J. E. Brown
*23. Nansemond Ordnance Depot Portsmouth, Va. Ammunition Storage and Loading Plant	Lt. Col. C. C. Terry
*24. Curtis Bay Ordnance Depot South Baltimore, Md. Ammunition Storage and Loading Plant	Lt. Col. H. A. Willis

* Now in operation

ORDNANCE ARSENALS, DEPOTS AND PROVING GROUNDS

	Name	Commanding Officer
* 25.	Aberdeen Proving Ground Aberdeen Proving Ground, Md. Proof of Equipment and Ammunition	Brig. Gen. J. B. Rose
* 26.	Charleston Ordnance Depot North Charleston, S. C. Ammunition Storage and Loading Plant	Col. Roger Taylor
* 27.	Augusta Ordnance Depot Augusta, Ga. General Supplies and Storage	Lt. Col. A. H. Skinner
* 28.	Erie Proving Ground LaCarne, Ohio General Supplies Storage, Ammunition Storage	Lt. Col. Thomas K. Vincent
* 29.	Savanna Ordnance Depot Savanna, Ill. Ammunition Storage and Loading Plant	Lt. Col. L. P. Crim
* 30.	Rock Island Arsenal Rock Island, Ill. Gun Carriages and Combat Vehicles	Brig. Gen. N. F. Ramsey
* 31.	San Antonio Ordnance Depot San Antonio, Texas General Supplies and Storage	Col. J. C. Booton
* 32.	Ogden Ordnance Depot Ogden, Utah Ammunition and General Supply Storage Loading Plant	Maj. J. W. Proctor
* 33.	Benicia Ordnance Depot Benicia, Calif. General Supplies Storage Ammunition Storage	Col. P. J. R. Kiehl
34.	Ravenna Ordnance Depot Ravenna, Ohio Ammunition Storage, General Supplies Storage	Lt. Col. R. S. Chavin

* Now in operation.

ORDNANCE ARSENALS, DEPOTS AND PROVING GROUNDS

	Name	Commanding Officer
35.	Anniston Ordnance Depot Anniston, Alabama Ammunition and General Supplies Storage	Capt. John W. Quickmire
36.	Jefferson Proving Grounds Madison, Indiana Proof of Equipment and Ammunition	Lt. Col. De R. C. Cabell
37.	Wingate Ordnance Depot Fort Wingate, New Mexico Ammunition Storage	Lt. J. C. Wilson
38.	Umatilla Ordnance Depot Hermiston, Oregon Ammunition Storage	Capt. E. E. Reynolds

* Now in operation

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MACHINE GUN PLANTS, MACHINE GUN EXPANSION, AND 37 MM. AA. GUN EXPANSION

	Name	Contractor	Commanding Officer
39.	Hartford, Conn. Machine Gun Expansion	The Colts Patent Fire Arms. Mfg. Co. Hartford, Conn.	Hartford Ordnance District
40.	Hartford, Conn. 37 MM. AA. Gun Expansion	The Colts Patent Fire Arms Mfg. Co. Hartford, Conn.	Hartford Ordnance District
41.	Utica, N. Y. Machine Gun Plant	Savage Arms Corp. Utica, N. Y.	Capt. R. H. Coombs
42.	Syracuse, N. Y. Machine Gun Plant	General Motors Corp. 57th & Broadway New York, New York	Major J. J. Breen
43.	Flint, Michigan Machine Gun Plant	General Motors Corp. 57th & Broadway New York, New York	Major J. J. Breen
44.	Dayton, Ohio Machine Gun Plant	General Motors Corp. 57th & Broadway New York, New York	Major J. J. Breen
45.	Saginaw, Michigan Machine Gun Plant	General Motors Corp. 57th & Broadway New York, New York	Major J. J. Breen

PLANTS PRODUCING TNT & DNT
AND PLANTS PRODUCING TNT & DNT CONSTITUENTS

	Name	Contractor	Commanding Officer
46.	Morgantown Ordnance Works Morgantown, W. Va. Ammonia Plant	E. I. du Pont de Nemours and Co. Wilmington, Dela.	Lt. Col. John Huling, Jr.
47.	Ohio River Ordnance Works West Henderson, Ky. Ammonia Plant	Allied Chemical Co. (Solvay Process Co.) 61 Broadway New York, New York	
48.	Muscle Shoals, Ala. Ammonium Nitrate Plant	TVA Territory (rehabilitation)	
49.	Kankakee Ordnance Works Joliet, Ill. TNT & DNT Plant	E. I. du Pont de Nemours and Co. Wilmington, Dela.	Lt. Col. T. C. Gerber
50.	Weldon Spring Ord. Wks. Weldon Spring, Mo. TNT & DNT Plant	Atlas Powder Co. Wilmington, Dela.	Capt. C. R. Dutton
51.	Baytown Ordnance Works Baytown, Texas Toluol Plant	Humble Oil and Refining Co. Houston, Texas	Col. J. G. Booton
52.	Plum Brook Ordnance Plant Sandusky, Ohio TNT & DNT Plant	Trojan Powder Co. Allentown, Pa.	Capt. J. A. Rodenhauser

SMALL ARMS AMMUNITION PLANTS

	Name	Contractor	Commanding Officer
53.	St. Louis Ordnance Plant St. Louis, Mo. Small Arms Amm. Plt.	Western Cartridge Co. East Alton, Ill.	Capt. D. L. Van Sycle
54.	Denver Ordnance Plant Denver, Colorado Small Arms Amm. Plt.	Remington Arms Co. Bridgeport, Conn.	Lt. Col. Duncan McGregor
55.	Lake City Ord. Plt. Lake City, Mo. Small Arms Amm. Plant	Remington Arms Co. Bridgeport, Conn.	Capt. W. L. Bell

SMOKELESS POWDER PLANTS

	Name	Contractor	Commanding Officer
56.	Radford Ordnance Works Pepper, Virginia Smokeless Powder Plt.	Hercules Powder Co. Wilmington, Dela.	Lt. Col. M. M. Serren
57.	Indiana Ordnance Works Charlestown, Ind. Smokeless Powder Plt.	E. I. du Pont de Nemours and Co.	Lt. Col. R. E. Hardy
58.	Alabama Ordnance Works Childersburg, Ala. Smokeless Powder Plt.	E. I. du Pont de Nemours and Co. Wilmington, Dela.	Lt. Col. James D. McIntyre

SHELL LOADING PLANTS

	Name	Contractor	Commanding Officer
59.	Ravenna Ordnance Plant Ravenna, Ohio Shell Loading Plant	Atlas Powder Co. Wilmington, Dela.	Lt. Col. R. S. Chavin
60.	Kingsbury Ordnance Plant LaPorte, Indiana Shell Loading Plant	Todd & Brown 9 Rockefeller Plaza New York, New York	Maj. W. J. D'Espinosa
61.	Elwood Ordnance Plant Joliet, Ill. Shell Loading Plant	Sanderson & Porter 52 William St. New York, New York	Lt. Col. T. C. Gerber
62.	Iowa Ordnance Plant Burlington, Iowa Shell Loading Plant	Day & Zimmerman Co. Philadelphia, Pa.	Maj. Otto M. Jank
63.	Wolf Creek Ordnance Plant Milan, Tennessee Shell Loading Plant	Proctor & Gamble Cincinnati, Ohio	Capt. J. Horridge

BAG LOADING PLANTS

	Name	Contractor	Commanding Officer
64.	New River Ordnance Plant Pulaski, Virginia Bag Loading Plant	Hercules Powder Co. Wilmington, Dela.	Lt. Col. M. M. Serren
65.	Hoosier Ordnance Plant Charlestown, Ind. Bag Loading Plant	Goodyear Eng. Corp. Akron, Ohio	Lt. Col. R. E. Hardy
66.	Coosa River Ordnance Plant Chilcersburg, Ala. Bag Loading Plant		Lt. Col. James D. McIntyre

SHELL FORGING AND MACHINING PLANT

	Name	Contractor	Commanding Officer
67.	Gadsden Ordnance Plant Gadsden, Alabama Shell Forging and Machining Plant	Lansdowne Steel & Iron Co. Morton, Pa.	Capt. J. S. Walker

TANK MANUFACTURING PLANT

	Name	Contractor	Commanding Officer
68.	Detroit Ordnance Plant Detroit, Michigan Tank Mfg. Plant	Chrysler Corporation Detroit, Michigan	Lt. Col. H. W. Rehm

155 MM. CANNON PLANT

	Name	Contractor	Commanding Officer
69.	Homestead, Pa. 155 MM. Cannon Plant	Mesta Machine Co. P. O. Box 1466 Pittsburgh, Pa.	Pittsburgh Ord. District

ARMOR PLATE PLANT

	Name	Contractor	Commanding Officer
70.	Philadelphia, Pa. Armor Plate Plant	Henry Disston & Sons, Inc. Philadelphia, Pa.	Philadelphia Ordnance District

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Washington Post 11/26/41

WOMEN EMPLOYED IN ARMS FACTORY? FIRST SINCE 1917

Springfield, Mass. Nov. 24.(AP) -
Women are working as machinists at the Springfield Armory--the first employed there since the World War--to meet an acute shortage of skilled male labor.

The initial group hired today included 13 millers, grinders and punch press operators and a forelady who will work with veteran employees in the production of Garand rifles.

More women will be employed as soon as a civil service list is prepared.

Said Mrs. Ella A. Miller, 39,mother of two daughters and the forelady employed today:

"I feel that at a time like this all women who are qualified to do defense work should get out and do it."

PLAIN DEALER, CLEVELAND, OHIO, March 4, 1941

WOMEN OF AKRON IN DEFENSE ROLE
NOW MORE THAN EVER, THEIR WORK IS BIG AID TO U.S.
(By Edward Kernan)

AKRON, O., March 3 --- Building for the adequate defense of the United States is a man-sized job but Akron women are equal to it.

Women always have had a place in the mammouth industry that is rubber, but now, more than ever before, they are playing a major role as this "industrial valley" of smoke, grime and rubber dust goes all-out to cushion war gear with its principal product.

The dexterous fingers of the women have been assigned to the lighter but equally important work in the city's industries.

Supplement Manpower

Thus they supplement Akron's manpower, the "toil and sweat" called for in the rush order to put this nation in a position to be ready with a more powerful fighting force than any that could be thrusted upon us by any aggressor or combination of aggressors.

Throughout the shops and offices of the major rubber companies as well as in lesser plants and factories, rows upon rows of women are digging in to assist man in the giant work of preparing Uncle Sam's defense.

Complete Priority is Policy

Companies here which are "up to our necks" in defense orders include the Goodyear Tire & Rubber Co., the B.F. Goodrich Co., The Firestone Tire & Rubber Co., the General Tire & Rubber Co., and the Seiberling Rubber Co.

Paul W. Litchfield, chairman of the Goodyear board, explained that Goodyear's fixed policy was to give "complete priority in resources, research, and personnel to the country's defense needs."

Heads of other companies have adopted similar attitudes.

Hundreds of women here are devoting their time to the manufacture of gas masks.

Perform Deft Tasks

Others work on rubberized-cloth that will go into free barrage balloons and non-rigid lighter-than-air dirigibles (blimps), now being built by Goodyear for the United States Navy.

Others perform deft but necessary tasks on such important defense needs as bullet sealing tires and tubes, bullet-proof gasoline tanks for combat planes, floating bags that will bouy up planes forced down on water and inflatable rubber boats that may be called on to save the lives of plane crews dumped into the sea.

Explosives Mfg., ammunition Mfg & loading.

"CHEMICAL MANPOWER FOR NATIONAL DEFENSE"

Chemical and Metallurgical Engineering, Jan. 1941, pp. 96-98.

It is estimated that 65,000 to 70,000 men will be needed for operation of America's munition plants, and 4,000 will have to be chemically trained; and in addition the Army will need about 2000 chemical inspectors.(p. 96). This shortage will begin to be felt in the summer of 1941 when more of the plants get into operation. The Memphis, Tenn. plant for the British government had been operating for over a month at the time this article was written.

Part of the Charlestown, Ind. plant will be ready for operations this spring (1941). The Radford, Virginia plant will be completed in the early part of the summer of 1941. The high explosives plants at Wilmington, Illinois, Sandusky, Ohio, and Weldon Springs, Mo. will not start production before next fall.

All these plants have been recruiting technical men and training them for supervisory work, some of these men having been taken from the ranks of present employees of the powder companies.

It is anticipated that an additional appropriation is to be made for a similar chain of munitions plants.

TECHNICAL AND NON-TECHNICAL LABOR SUPPLY

"The proportion of technical men is higher in TNT manufacture than in powder making and much higher than in ammunition loading. There is a still higher proportion of technical men in synthetic ammonia and ammonium nitrate plants." p. 98.

"Two companies said they planned to use chemical engineers as long as they are available because they are more mechanical minded. Chemists will be used in the laboratories and on the supervisory staffs when chemical engineers are no longer obtainable. It will probably be necessary to fill in the ranks of foremen and sub-foremen with non-technical men who have been given intensive training. Non-skilled and non-technical labor will be recruited from the locality of the plants wherever possible." pp. 97-98.

AMMUNITION LOADING:

"In the case of ammunition loading, it is probable that women will fill a large proportion of the unskilled jobs as was the case in the World War. Certain advantages such as more careful attention to details and greater manipulative dexterity are claimed for feminine workers. There is also the advantage that they will not have to be surrendered to the army should the call for man-power there become more intensive. In an accompanying photograph (p.99) women are shown at work assembling gas masks at Edgewood Arsenal." p. 98

As much as $12,000,000 may be spent on new construction at Edgewood Arsenal. "It (the Government) is building several other plants (mostly for gas masks and activated carbon) in connection with privately owned plants." p. 98.

"CHEMICAL MUNITIONS PLANTS"

Chemical and Metallurgical Engineering, Nov. 1940, A. Robert Ginsburgh, Lt. Col., War Dept., Washington, D. C.

FACTORS ENTERING INTO THE CONSIDERATION OF SITES FOR MUNITIONS PLANTS:

1) The sight must be such as to assure the earliest possible production.

2) Space for expansion of plant.

3) No plants may be constructed within 200 to 250 miles from a geographic boundary.

4) Decentralization throughout the country so as to avoid any concentration. Also, decentralization is important as a safety factor in manufacturing high explosives.

5) The availability of labor and the labor supply.

6) Availability of raw material.

7) Transportation facilities (roads and railroads).

8) "special care must also be taken to see that it is free of gas, oil and water lines, as well as mineral deposits, and assigned mineral rights." p. 769

* * *

(In addition to these requirements there are others applicable to the particular type of munitions plant being constructed.)

REQUIREMENTS FOR SMOKELESS POWDER PLANTS:

1) 6,000 acres, 2,000 of which are level.

2) Coal and water in great abundance.

3) Electric power.

4) Supplies near-by: alcohol, ether, nitric acid, cotton linters or wood pulp, etc.

5) Facilities for disposal of waste.

6) Supply of semi-skilled and inskilled labor within a radius of 25 miles. "Metal workers, lead burners and those engaged in subsidiary trades in smaller numbers should also be available in the vicinity of the plant." p. 769.

PLANTS: Charlestown, Indiana, (Du Pont)
Radford, Va. (Hercules)

REQUIREMENTS FOR EXPLOSIVE PLANTS: (Same requirements as for smokeless powder plants except for raw materials.)

1) A supply of "tolul, diphenylamine, phenol, natural gas or other hydrocarbous, nitric and sulphric acids." p. 760

PLANTS: Wilmington, Ill. TNT, DNT, and Tetryl (Atlas Powder Co.)
Weldon Springs, Mo.: TNT (Atlas Powder)
Baytown, Texas (near Huston): Totuol plant, Humble Oil and Refining Co.

REQUIREMENTS FOR BAG LOADING:

1) Two or three times as much space is needed as for an explosive plant; 12,000 to 18,000 acres, and this must be mainly level land.

2) "It must be reasonably close to powder and explosive plants and to other factories from which component parts are obtained; and to field facilities where loaded ammunition is stored." p. 734.

3) "Labor requirements call for a readily available supply of skilled, semi-skilled and unskilled of whom approximately one-third should be women, and for the presence in the vicinity of the site of a reasonable number of metal workers, lead burners and others." p. 734

PLANTS: Ravenna, Ohio (Atlas Powder)
Wilmington, Ill. (Sanderson and Porter)

PLANTS FOR FORGING AND MACHINING SHELLS

There had been only one site selected for such a plant in Nov. 1940, and that plant was to be in Gadsden, Alabama and operated by the Landsdowne Steel and Iron Co. of Morton, Pennsylvania.

DEFENSE INDUSTRIES: LIGHT MACHINERY

From Start to Finish, Women are Employed In Making 45,000 Bandage Shears for Army

(In Bridgeport, Conn., Post, February 17, 1941)

Bridgeport. -- Women are keen on scissors. That's why women at the Acme Shear company are working on the War Department's order for 45,000 pairs of heavy bandage shears.

Assembling, shaping, sharpening, testing, chrome-plating--women do the work.

Dressed in khaki bloomers and goggles to protect their eyes, women (with the exception of one or two men) sit at carborundum wheels, sharpening scissors after scissors, with sparks flying like fireworks.

"I know it's for the government and I have to do an excellent job," said Mrs. Frances Pawlowicz, 29, sharpening some of the Army's shears. The 45,000 pairs will be sent to the Medical section general depot in Brooklyn within six months.

She likes her work, which requires skill and alertness.

"You can't press hard or you'll burn the shears."

Each pair must be four times as sharp as ordinary scissors -- sharp enough to cut four thicknesses of heavy canvas sheeting (the test). The government's specifications are now more severe than during the World war.

During the World war, Mrs. Pawlowicz was a girl of 12 in Poland, "frightened" at the sight of wounded soldiers in the village of Mastkowo.

This war finds her "glad" to be living in America, to be getting her second citizenship papers, to be working at the Acme-Shear--where she is sharpening Uncle Sam's bandage shears at the rate of 150 pairs per hour. (Picture).

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Women in Canton Aid Defense Task

(In Plain Dealer, March 2, 1941)

Canton, O., March 1 -- Reaching into the home, national defense has called Canton women to arms and hundreds have answered the call.

Women are in the assembly lines of large factories, in Red Cross headquarters, in church auditoriums, in club rooms and in individual homes, doing their bit in the all-important drive to arm the nation so it can defend itself.

Young, strong girls, innumerable rows of them, work in the big factories as machine operators, assemblymen and inspectors . . . . .

At the Timken Roller Bearing Co. plant here on Dueber Avenue S.W., which is geared to produce at top speed for defense, about 1,000 of the company's estimated 9,600 employes are women, employed as inspectors, assemblymen and operators of light machinery.

Their purses strapped over the back of the machines and wearing uniforms,these girls, who must be 21 and single, work 40 hours a week, with time-and-a-half for overtime, which has been running about five hours a week.

The company is manufacturing bearings for army trucks; airplanes and the navy. Most of the company's bearings go to concerns which have government defense contracts.

In neighboring North Canton, the Hoover Co., suction sweeper manufacturers, is hastening construction on a plant addition which will employ about 400 women, or about two-thirds of the personnel, in making shell fuses.

Some women are already working on the defense orders there.

Another Canton plant working for national defense is that of Weber Dental Manufacturing Co. on Mahoning Avenue and 13th Street N.E.

About 20 girls are employed there on sub-assembly, performing intricate work best-adapted for women, according to T. M. McDonald, vice president and general manager, who said that men's hands in such work were "all thumbs."

The company manufactures dental operating units, X-ray apparatus and dentist's chairs, which the government has ordered for the increasing number of army camps and training centers.

Women in Canton Aid Defense Task (Cont'd)
(In Cleveland Plain Dealer, March 2, 1941)

The company, which employs about 280 persons now, is one of three in the country in that field.

The girls assemble and insert wires in low-voltage dental instruments used in examination of the teeth.

One girl operates a coil-winding machine, another places platinum tips on a lancing instrument while still another inserts wiring on a delicate instrument which determines by a touch whether a tooth is alive or dead.

McDonald revealed that the company is now working out details for producing an additional defense product, flying instruments for airplanes.

About 50 girls would be employed in this work.

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Akron's Women Do Their Full Share of Work to Make Uncle Sam Invincible

(In Cleveland Plain Dealer, March 4, 1941)

Akron. -- Women are at work on the gas mask assembly line. Hundreds of women are working on gas masks in Akron factories. . . . (Pictures).

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DEFENSE INDUSTRIES - LIGHT MACHINERY

MICHIGAN

Girls work on gas masks at Detroit plant of Eureka Vacuum Cleaner Company. Pictures show them installing head harness, and attaching chemical containers. The Michigan National Youth Administration and the City of Detroit are cooperating to give skilled industrial training to 60 girls between the ages of 16 and 24. Later it is expected that several hundred will be taking training regularly. Pictures show girls working on lathes and doing arc welding. (Youngstown Vindicator, April 13, 1941 and Miami Daily News Rotomagazine, April 6, 1941).

NEW YORK

Already in Buffalo, Fedders Radiator Corp., producing clips for machine gun ammunition, Trico Products producing small parts for various defense industries, and other industries, are employing an increasing number of women in various departments. (Daily News Record, February 21, 1941.)

OHIO

The Ravenna ordnance plant will employ about 3,000 women when it is placed in operation by the Atlas Powder Company this summer. No married women will be employed. (Akron Beacon Journal, March 17, 1941).

New Jobs for Women Workers

One phenomenon of the war abroad has been the extent to which European women have been recruited for jobs formerly the province of men.

Some French fighter planes were being produced entirely by women just before the Armistice, reports Frieda Miller, Industrial Commissioner of N.Y. State. One Spitfire airplane factory in England is manned 50% by women, who work with pictures of favorite movie stars on the walls.

Both in England and in Germany women work as truck drivers and railway conductors. Both countries conscript young women for work, to release available man power for the armed forces or for more highly skilled work. Despite Hitler's pre-war declarations that women belonged in the home, one-third of all German workers are women.

In the United States, where the shortage is not so much of man power as of skilled labor, women have not gone into booming defense industries and stepped into men's shoes and overalls, to the same extent. In airplane factories, for instance, they are generally used for sewing or doping airplane fabrics or for making certain inspections of engine parts. The great majority of workers are men.

Nevertheless, there was a faster increase in employment of women than men in certain industries--in electrical machinery and supplies, glass pottery, hardware and a few others--from the spring of 1939 to the spring of 1940, according to the Department of Labor's Women's Bureau. Since then, conscription of men and the tremendously increased demand for skilled men workers in defense industries has no doubt increased the demand for women workers, particularly in semi-skilled fields.

Even in a defense industry like cartridge and shell-making, women now operate punch presses, assemble primers to shells on dial presses and run machines for shell drawing cups.

The National Women's Trade Union League of America reports, "A new government munitions plant now being built not far from Cleveland expects to take on a force including some 2,500 women. At the Frankford Arsenal in Philadelphia, women are wrapping and packing shells, and working at huge precision machines as inspectors of shell cases.

"In the Chrysler plant, women are examining metals through a spectroscope. In a large electrical manufacturing company, over a third of the employees making watt hour meters are women. In instrument factories, women are assembling parts with riveting presses, automatic screw drivers, soldering and electric spot welding. In machine tool plants, women are wrapping and winding coils. In one plant, women are found more efficient than men at driving and controlling overhead cranes. A Connecticut local of the International Association of Machinists lately reported admission of women to the union for the first time. Foot and power press operation and bench work are their chief occupations.

The number of available women workers for speeding defense production is estimated at nearly two million; and of the 373,000 women registered at employment agencies for defense industry work, three-fourths are said to have the necessary skills, according to Mary Anderson of the Women's Bureau.

It is admitted, however, that generally women lack shop training practice, blueprint reading and technical background for many defense industries. Also, women's lack of strength and stamina does not qualify them for such strenuous work as shipbuilding, which needs from 200,000 to 300,000 workers to expand to new contemplated capacity.

But certain types of work are done particularly well by women. This is the conclusion of a report on desirable standards for the employment of women in defense industries, prepared by the Women's Bureau and a committee representing eight unions. Women are excellent at work requiring care and constant alertness, good eyesight and the use of light tools such as gages and micrometers, but not at work requiring such physical exertion. They are also good at work requiring manipulative dexterity and speed. However, it's pointed out they cannot work so long as men; that they work best at jobs if seated; and that they required more safety equipment on machines. The trend toward simplification of work routines by the use of more highly automatic machines would tend to favor the employment of women in semi-skilled defense jobs.

The British experience has been that women can step into a great many occupations new to them, ranging from industrialized farming to machine tool operation to police duty. The ability of women to do work that was previously done by men has been one of the outstanding revelations of the war, it is claimed. In general, women get less money than men for the same work, except in certain occupations such as bus conductors. In this field, women over 21 get the same pay as men, but there is a provision women will hold these jobs merely for the duration of the war.

Barron's April 21, 1941

WOMEN'S BUREAU
U.S. Department of Labor
Washington, D. C.

#2

WOMEN HAVE DEFENSE ROLE AT R.C.A. IN CAMDEN

The importance of women in key national defense industries is stressed in Camden RCA where Miss Jewel Williams, of the Special Apparatus Division, occupies a unique position in the national defense program as exemplified in the city's industries. Miss Williams, shown in the picture (see clipping) is engaged in the operation for which she trains girls at RCA--a small spiral of metal, set in a deep part of one of the instruments vital to the defense, formerly was placed by the long pliers near Miss Williams' right hand. This time-costing operation was eliminated when it was found delicate female hands could get the screws in place without using the pliers. Hands of hundreds of women, trained by Miss Williams (who has trained 900 RCA girls since she went to work for the old Victor Company in 1918) have "that certain feminine touch" enlisted by the nation for a special role, applying solder to important delicate wire connections.

Courier - Camden, N. J. - April 21, 1941

DEFENSE INDUSTRIES: LIGHT MACHINERY

From Start to Finish, Women are Employed In Making 45,000 Bandage Shears for Army

(In Bridgeport, Conn., Post, February 17, 1941)

Bridgeport. -- Women are keen on scissors. That's why women at the Acme Shear company are working on the War department's order for 45,000 pairs of heavy bandage shears.

Assembling, shaping, sharpening, testing, chrome-plating--women do the work.

Dressed in kahki bloomers and goggles to protect their eyes, women (with the exception of one or two men) sit at carborundum wheels, sharpening scissors after scissors, with sparks flying like fireworks.

"I know it's for the government and I have to do an excellent job," said Mrs. Frances Pawlowicz, 29, sharpening some of the Army's shears. The 45,000 pairs will be sent to the Medical section general depot in Brooklyn within six months.

She likes her work, which requires skill and alertness.

"You can't press hard or you'll burn the shears."

Each pair must be four times as sharp as ordinary scissors -- sharp enough to cut four thicknesses of heavy canvas sheeting (the test). The government's specifications are now more severe than during the World war.

During the World war, Mrs. Pawlowicz was a girl of 12 in Poland, "frightened" at the sight of wounded soldiers in the village of Mastkowo.

This war finds her "glad" to be living in America, to be getting her second citizenship papers, to be working at the Acme Shear--where she is sharpening Uncle Sam's bandage shears at the rate of 150 pairs per hour. (Picture).

- - - - - - - - - - - - -

Women in Canton Aid Defense Task

(In Cleveland Plain Dealer, March 2, 1941)

Canton, O., March 1 -- Reaching into the home, national defense has called Canton women to arms and hundreds have answered the call.

Women are in the assembly lines of large factories, in Red Cross headquarters, in church auditoriums, in club rooms and in individual homes, doing their bit in the all-important drive to arm the nation so it can defend itself.

Young, strong girls, innumerable rows of them, work in the big factories as machine operators, assemblymen and inspectors. . . . . .

At the Timken Roller Bearing Co. plant here on Dueber Avenue S.W., which is geared to produce at top speed for defense, about 1,000 of the company's estimated 9,600 employes are women, employed as inspectors, assemblymen and operators of light machinery.

Their purses strapped over the back of the machines and wearing uniforms, these girls, who must be 21 and single, work 40 hours a week, with time-and-a-half for overtime, which has been running about five hours a week.

The company is manufacturing bearings for army trucks; airplanes and the navy. Most of the company's bearings go to concerns which have government defense contracts.

In neighboring North Canton, the Hoover Co., suction sweeper manufacturers, is hastening construction on a plant addition which will employ about 400 women, or about two-thirds of the personnel, in making shell fuses.

Some women are already working on the defense orders there.

Another Canton plant working for national defense is that of Weber Dental Manufacturing Co. on Mahoning Avenue and 13th Street N.E.

About 20 girls are employed there on sub-assembly, performing intricate work best-adapted for women, according to T. M. McDonald, vice president and general manager, who said that men's hands in such work were "all thumbs."

The company manufactures dental operating units, X-ray apparatus and dentist's chairs, which the government has ordered for the increasing number of army camps and training centers.

Women in Canton Aid Defense Task (Cont'd)
(In Cleveland Plain Dealer, March 2, 1941)

The company, which employs about 280 persons now, is one of three in the country in that field.

The girls assemble and insert wires in low-voltage dental instruments used in examination of the teeth.

One girl operates a coil-winding machine, another places platinum tips on a lancing instrument while still another inserts wiring on a delicate instrument which determines by a touch whether a tooth is alive or dead.

McDonald revealed that the company is now working out details for producing an additional defense product, flying instruments for airplanes.

About 50 girls would be employed in this work.

- - - - - - - - - - - - - -

Akron's Women Do Their Full Share of Work to Make Uncle Sam Invincible

(In Cleveland Plain Dealer, March 4, 1941)

Akron. -- Women are at work on the gas mask assembly line. Hundreds of women are working on gas masks in Akron factories. . . . . (Pictures).

- - - - - - - - - - - - - -

DEFENSE INDUSTRIES - LIGHT MACHINERY

MICHIGAN

Girls work on gas masks at Detroit plant of Eureka Vacuum Cleaner Company. Pictures show them installing head harness, and attaching chemical containers. The Michigan National Youth Administration and the City of Detroit are cooperating to give skilled industrial training to 60 girls between the ages of 16 and 24. Later it is expected that several hundred will be taking training regularly. Pictures show girls working on Lathes and doing arc welding. (Youngstown Vindicator, April 13, 1941 and Miami Daily News Rotomagazine, April 6, 1941)

NEW YORK

Already in Buffalo, Fedders Radiator Corp., producing clips for machine gun ammunition, Trico Products producing small parts for various defense industries, and other industries, are employing an increasing number of women in various departments. (Daily News Record, February 21, 1941.)

OHIO

The Ravenna ordnance plant will employ about 3,000 women when it is placed in operation by the Atlas Powder Company this summer. No married women will be employed. (Akron Beacon Journal, March 17, 1941)

New Jobs for Women Workers

One phenomenon of the war abroad has been the extent to which European women have been recruited for jobs formerly the province of men.

Some French fighter planes were being produced entirely by women just before the Armistice, reports Frieda Miller, Industrial Commissioner of N.Y. State. One Spitfire airplane factory in England is manned 50% by women, who work with pictures of favorite movie stars on the walls.

Both in England and in Germany women work as truck drivers and railway conducters. Both countries conscript young women for work, to release available man power for the armed forces or for more highly skilled work. Despite Hitler's pre-war declarations that women belonged in the home, one-third of all German workers are women.

In the United States, where the shortage is not so much of man power as of skilled labor, women have not gone into booming defense industries and stepped into men's shoes and overalls, to the same extent. In airplane factories, for instance, they are generally used for sewing or doping airplane fabrics or for making certain inspections of engine parts. The great majority of workers are men.

Nevertheless, there was a faster increase in employment of women than men in certain industries—in electrical machinery and supplies, glass pottery, hardware and a few others—from the spring of 1939 to the spring of 1940, according to the Department of Labor's Women's Bureau. Since then, conscription of men and tremendously increased demand for skilled men workers in defense industries has no doubt increased the demand for women workers, particularly in semi-skilled fields.

Even in a defense industry like cartridge and shell-making, women now operate punch presses, assemble primers to shells on dial presses and run machines for shell drawing cups.

The National Women's Trade Union League of America reports, "A new government munitions plant now being built not far from Cleveland expects to take on a force including some 2,500 women. At the Frankford Arsenal in Philadelphia, women are wrapping and packing shells, and working at hugh precision machines as inspectors of shell cases.

"In the Chrysler plant, women are examining metals through a spectroscope. In a large electrical manufacturing company, over a third of the employees making watt hour meters are women. In instrument factories, women are assembling parts with riveting presses, automatic screw drivers, soldering and electric spot welding. In machine tool plants, women are wrapping and winding coils. In one plant, women are found more efficient than men at driving and controlling overhead cranes. A Connecticut local of the International Association of Machinists lately reported admission of women to the union for the first time. Foot and power press operation and bench work are their chief occupations.

The number of available women workers for speeding defense production is estimated at nearly two million; and of the 373,000 women registered at employment agencies for defense industry work, three-fourths are said to have the necessary skills, according to Mary Anderson of the Women's Bureau.

It is admitted, however, that generally women lack shop training practice, blueprint reading and technical background for many defense industries. Also, women's lack of strength and stamina does not qualify them for such strenuous work as shipbuilding, which needs from 200,000 to 300,000 workers to expand to new contemplated capacity.

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Barron's April 21, 1941

Confidential

Plans for Employment of Women in Shell Loading Plant, Ravenna, Ohio
(Interview with Miss Hazel Day, February 25, 1941)
At Wilmington, Delaware

Number of women to be employed

Fifty percent of the 5,000 to 6,000 employees will be women.

Skill of work

1. Two weeks experience on the jobs will make proficient workers in jobs women will do.
2. Foreladies (25) experienced in supervising women in factory work will be trained 3 weeks for their jobs.

Experience required of workers

1. Want girls experienced in assembly line work in factories.

Description of work women will do

Fuse assembly, detonator line, booster assembly

1. 75% of the women will be in fuse, booster and detonator assembly. The manufacture of a fuse includes several hundred specialized operations.
2. The work will involve exposure to tetryl, fulminate of mercury, lead azide and black powder, and will consist of assembling small parts, inspection by visual and gauge methods, operation of small presses, etc.
3. Not over 30 persons will work in one building at this type of work.
4. Expected production - 40,000 detonators daily.
5. Young women under 30 wanted for this work.

Sewing machine operation

1. Very few stitchers will be employed since no bag loading will be done. The few stitchers will be at work repairing bags that have been shipped in for use in shell loading.
2. Sewing machine - 1 in a compartment. Bags will be filled with black powder. Needle will be bronze, machine of some metal other than steel.
3. Only older women will be employed as stitchers (older women prefer this work).

Manufacturing pellet charges - black powder and tetryl pellets

1. Steel walled compartments, machines operated from outside compartment.

Weighing charges - black powder and smokeless powder

1. 3 girls and supervisor occupy one compartment which is steel walled, explosion proof.
2. Compartments small, light, well ventilated, floors painted red so any powder will show.

Metal parts

1. About 18% of all women will work on assembly and inspection of small metal parts.
2. Buildings separate from any explosive operations.

Uniforms

1. All women employees will be provided without charge with 3 uniforms consisting of tan short sleeve blouses and slacks.
2. Laundering done by company.
3. Powder shoes required wherever explosives in use.

Showers

1. All workers with toxic material (only men) will have 30 minutes working time for showers. Must leave street clothes in locker room, go through showers to put them on, leaving work clothes in room on other side of showers.

Medical set up

1. One full-time surgeon in charge.
2. Thirty trained nurses.
3. Train workers in first aid courses.

OCCUPATIONS

ORDNANCE + EXPLOSIVES - 1942

Return to Robinson

Interview with Mrs. Charlotte Lochhead, S.O. of N.J. Sept. 17, 1942

Gilbert & Parker plant in Springfield, Mass.
(make fuzes, cables, etc.)

175 new women since March. There are100 in the factory, 100 in the office. About 2000 men; will lose 400, and will replace with women

Women average $34.20 a week.

Women get 57¢ an hour, then raise to men's 65¢ rate. Wage increase after 2-3 mos. and then come production bonuses (except for inspection dept).

Training school in plant (1) for upgrading (2) where background shows good material, training in something else is given ~~than~~ to take her off present job. It is an old apprenticeshop. Not all coming in go to school.

Before this emergency, there were no women in the plant except at the time of the last war. There are no women supervisors yet.

Girls only on 3-11 and 7-3 shifts; half hour lunch period, 10-min. rest period. two nurses, and 1 male nurse, part-time M.D. 7¢ hr. more on 3-11 shift.

Girls in younger age being hired; now are taking 2 women 45 and 49, who will be used in the crib room; took training.

On the inspection floor, practically all employees are girls and women.

The girls in the plant are "nice", have been recruited from the trade school in Springfield, and the company has gotten the best of the classes because Gilbert & Parker have always paid the best wages.

The matron is newly hired; she was a schoolteacher. She has charge of the girls' washroom and lockers, maintains discipline by not allowing too much time spent in the washroom. Mrs. Lochhead said, however, that when she was there, the room was constantly filled with girls, and she explained it by saying it was during the middle of the day when some of the rest periods, as well as the lunch period, probably coincided. (For one of the shifts, 1-hour lunch period was permitted, but she couldn't straighten this out to my satisfaction in view of her statement above that half-hour lunch periods were usual.) The matron has various cold creams to remove oil; vaseline for other substances hurtful to the skin; etc.

There is a cafeteria; also coke stands. The girls can get cokes off and on.

not a steel plant

~~Inquirer~~
P Phillips
~~Gordon~~
Return to Rotman

FROM: United States Steel Corporation Subsidiaries,
Pittsburgh, Pennsylvania.

FOR RELEASE IN AFTERNOON PAPERS FRIDAY, SEPTEMBER 4, 1942

Oil City, Pa., Sept. 4 - Skillfully-trained women are gradually outnumbering the men employees in the small shell department of Oil Well Supply Company, a United States Steel subsidiary.

Schooled in the technique of milling and threading these high explosive projectiles, a growing production army of attractive, young women attired in slacks is replacing the men called for military service and those upgraded into other divisions of this important war plant.

Months ago, the company foresaw the need of training women to meet the labor demands of an expanding shell production program and a growing shortage of man labor in the community. In cooperation with the local school authorities and the federal and state employment offices, a six-weeks training program was set up at a nearby vocational school. The training includes instruction in blueprint reading and the use of precision gauges such as those employed in the shell department.

To assist in the training, the company provided the school with the services of one of the plant's most experienced inspectors, and workers in the plant loaned the training class precision gauges and other inspection equipment which could not be obtained otherwise. The inspector served as an instructor for the first class and is assisting in supervising the work of the women now employed in the plant.

From the first class of women completing the training course, nine were drafted by the Army Ordnance Department and were qualified as Army inspectors at the plant.

Most of the others are now engaged on the finishing and inspection benches, where the small shells are threaded, examined for flaws, and then painted and

packed in boxes. As the department expands and more women are trained, those new on the job are scheduled to replace men now working on other operations in the plant.

The women enjoy two 10-minute rest periods each shift, and to help them relax, the company has furnished a comfortable recreation room with lounge chairs and plenty of the latest magazines.

The small shell department is located in a former warehouse that was stripped to the walls and converted into this direct war effort.

DISTRIBUTED BY: United States Steel Corporation Subsidiaries,
Washington, D. C.

war dept

DIVISION OF
PRESS INTELLIGENCE
1526 - 14 St. N. W.

NO.

SYMBOL 1 L

Town Talk (D)
Alexandria, La.

DATE SEP -4 1942

p.

War Department May Double Women Workers in Army Arsenals, Depots

WASHINGTON, Sept. 4.—(AP)—Secretary Stimson reported Thursday the war department intended to meet a growing manpower shortage by possibly doubling the number of women war workers in army arsenals, depots and office jobs.

About 300,000 women already are working on guns, planes and tanks and filling clerical and supervisory posts, and Stimson told his press conference as many more could be absorbed.

The war department, he said, has adopted a policy of using women employes in all capacities for which they are qualified or may become so by training.

In Preference to Men

"As far as practicable, women will be employed in preference to men of war service age or capabilities," he explained. "However, this policy will not limit the employment of qualified men who are ineligible for military service by reason of age or physical disability."

War department employing and training officers have been directed to "fully utilize, immediately and effectively, the largest and potentially the finest single source of labor available today—the vast reserve of women power," Stimson said.

Since June 1, he reported the number of skilled women workers in war department activities has risen from three to ten per cent. Almost 35 per cent of the unskilled workers are women.

No Bar to Married Women

Age limits for most jobs are 18 to 50 years and there is no bar to married women. Generally women workers must meet civil service requirements. Those without previous mechanical experience receive training of from nine to 12 weeks.

Stimson announced at the same time:

The army custom of decorating airplanes, tanks and other organizational equipment with individual designs has been officially authorized "in recognition of its value as a means of increasing the morale of a unit." Designs must be approved, and are registered by the quartermaster gen-

AMERICAN BUSINESS

MAY 1942

WOMEN'S BUREAU
MAY 15 1942
DEPARTMENT OF LABOR

How Small Plants Find War Work

The Hullabaloo About War Profits

When You Need More Office Room

Gadgets That Make Letters Pull

Can We Take Up Slack in Selling?

★ ★ ★ ★

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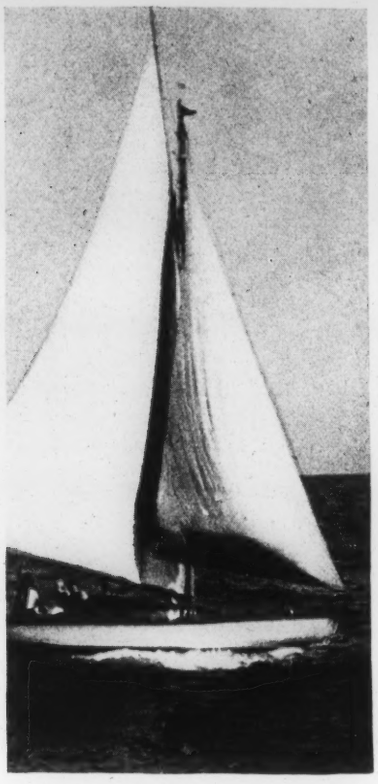

AMERICAN BUSINESS

Combined with System

ESTABLISHED 1900

MAY 1942

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Next Month

One of the most amazing developments of the whole War Production effort is the conversion of small business units to war production.

For June we have scheduled two stories about sizable war production jobs being undertaken where you would least expect to find them—one in the mid-Texas town of Corsicana, where a small manufacturer is busy at work on a war contract.

Another story comes from De Land, Florida, where the business men got together, moved the Johnny Jones Carnival out of the fair grounds, and began work on a contract for airplane engine assembly stands where once prize cattle and mouth-watering cakes and cookies were displayed.

Keep 'Em Flying

$3.00 a Year; Single Copies, 35 Cents

MEMBER: Audit Bureau of Circulations and the ABP Associated Business Papers, Inc. Published Monthly by

Dartnell Publications, Inc., 4660 Ravenswood Avenue, Chicago, U. S. A.

John Cameron Aspley, *Publisher* • Eugene Whitmore, *Editor* • Edwin H. Shanks, *Associate Editor* • H. E. Sankey, *Desk Editor*
J. T. Kemp, *Controller* • T. D. Reid, *Production Manager*

Entered as second class matter February 18, 1937, at the post office at Chicago, Ill., under act of March 3, 1879

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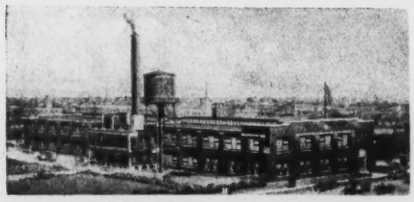


(Associated Press Photo)

LETTERS *and* COMMENT

Asks for Information On Radiant Heating

To the Editor:

In the October 1941 issue of American Business, I noticed an item on steam pipes in the concrete floor of a room to keep it warm. Can you supply me with additional or complete information on the subject or tell me where I may procure the information?—L. I. Levergood, *Union, New Jersey.*

Mr. Levergood: The method of heating by steam pipes buried under the floor is called radiant heating. The A. M. Byers Company of Pittsburgh has been a pioneer in the development of this method of heating. This company has published a booklet, *Byers Wrought Iron for Radiant Heating Installations,* which gives quite a comprehensive discussion of the problem.

We Rang the Bell On This One

To the Editor:

It occurs to me that the article by J. C. Aspley on "The Closed Shop Mirage," deserves much greater publicity than it could possibly receive in the course of its regular circulation in your estimable publication. May I suggest that it would be well worth while for you to give some consideration to some plan for bringing this excellent article to the attention of a much larger number of citizens of this country.—J. D. Tuller, *The Tuller Construction Company, Red Bank, New Jersey.*

To the Editor:

In the March issue of American Business I noted some very important articles, particularly "The Closed Shop Mirage," by J. C. Aspley, which is a masterpiece in my estimation. More power to you! If you will be kind enough to mail me twelve extra copies so that I may distribute them among my personnel I will more than appreciate it.—Philip N. Poulleys, *J. S. Contas Company, Boston, Massachusetts.*

Interest in Selling After the War

To the Editor:

We enjoy reading your magazine very much around here. Your article, "What Kind of Selling Can We Expect After the War?" in the April issue was a very profitable piece of writing.—Louis C. Nelson, *publicity manager, Cessna Aircraft Company, Wichita, Kansas.*

To the Editor:

I enjoyed your article on selling after the war printed in the April issue of American Business. I hope that you will have some articles relating to the outlook and methods that will be used in house-to-house selling after the war.—R. H. Alton, *manager, Worcester Suburban*

LOGISTICS

Strategy is the planning of warfare.

Tactics is the execution of those plans.

Logistics, the third branch of military science, is the supplying of everything necessary to strategy and tactics—in the right amount, at the right place, at the right time.

Now, in *total* war, we must apply the science of Logistics to all of our activities as a nation—civilian as well as military. WE-ALL are part of the Victory Program.

Our supply lines are literally life lines of the United Nations. Man-power *and* munition-power are the controlling factors.

Today, Logistics dictates strategy—determines tactics.

Congress has appropriated billions of dollars *but it cannot appropriate one single second of time.*

Time favors those who appreciate it as the priceless commodity it now is.

In war, when we save time we save lives—and we make our individual contribution to Victory.

DEPARTMENT OF LOGISTICS

INTERNATIONAL BUSINESS MACHINES CORPORATION

This message appeared in every daily newspaper, both English and foreign language, in the United States and Canada, on March 30, 1942

Dartnell And the War!

In common with most of our subscribers, the Dartnell organization is now geared to the war effort. Editorial and research facilities which have hitherto provided American industry with essential sales and management data will now also be directed to the procurement of information, plans, facts, and material of direct assistance to companies which are engaged in war production.

★ DARTNELL WAR PRODUCTION SERVICE (New)

This is a service intended for presidents, personnel managers, and production executives of all companies engaged in producing directly for the war effort. It provides a clearing house of tested plans and information covering (a) industrial relations, (b) supervisory training, (c) maintenance of workers' morale, (d) production incentive plans, (e) case studies of personnel and labor problems in specific plants, (f) scoreboard, bulletin board, poster material. The subscription for the complete service is $7.50 a month.

★ DARTNELL MORALE-BUILDING BOOKLETS (New)

Designed to do an industrial relations job and specifically to correct negative attitudes of employees and war production workers. Three are now available, one being a de luxe "Victory" booklet consisting of a pictorial presentation showing how war goods are used by the boys in the services. The other two are popular vest-pocket booklets, "I Will Win the War" and the "Gimme Boys," which sell the worker on his individual responsibility to help win the war. These are available in quantities at low rates.

★ "CIVILIAN DEFENSE" MAGAZINE (New)

Published monthly for key men in civilian defense and for the executive in charge of plant protection. This vital magazine brings reports by experts covering fire protection, air-raid precautions, industrial first aid, anti-sabotage work, etc. Also news of civilian defense activities throughout the nation and reports on communities which have done an outstanding job of civilian defense organization. "Civilian Defense" magazine will be read by civilian defense chairmen and plant protection executives. $2.00 a year.

★ DARTNELL POST-WAR PLANNING SURVEY (New)

Many progressive companies are thinking today how they will keep their plants busy when war orders end. This Dartnell Survey of Post-War Sales Trends should be studied by every management executive because it presents the experiences, thinking, planning, and market changes now being taken into account by those companies which are doing an outstanding job of post-war planning. Subscription fee is $12.50.

★ DARTNELL VICTORY PRODUCTION PRIZE BOOK (New)

Produced since war was declared. Represents a powerful tool which can be used to get action in the direction a company desires whether it be increased sales or increased production. Featuring a complete home with many attractive editorial features and color pages, over 1,000 prizes are offered varying in price from 25 cents to $100. The Government suggests prizes for war production workers.

Complete Information on Any of These New Dartnell "War Production" Aids Will Be Sent Immediately on Request

The Dartnell Corporation, 4660 Ravenswood Ave., Chicago, Ill.

Electric Company, Uxbridge, Massachusetts.

GENTLEMEN: We plan to publish a series of articles on selling after the war. The second one of this series appears in this issue beginning on page 20.

Another Salary Survey Coming Up

To the Editor:

In 1940 you made quite a study of office salaries in various cities which was available to subscribers to AMERICAN BUSINESS. I am wondering if you had a supplement to that study since that time. —F. W. MILLER, *controller, Parfumerie Bourjois, New York, New York.*

MR. MILLER: We have not made a salary survey since 1940. However, plans are underway now to conduct such a poll again later this year, and results will be published in AMERICAN BUSINESS magazine.

He Wants to Start a Waste Campaign

To the Editor:

I have a clipping from the March 1940 issue of AMERICAN BUSINESS, page 54 only. This is an extract from an article entitled, "First Steps in Setting Up a Budget Program." This covers a complete budgetary-control and saving-campaign set-up. I would like to obtain the complete article.

Two or three years ago you got out a perfectly splendid article covering the whole subject of a savings campaign. It dealt with the setting up of committees in the plant, described how to keep control and account for waste through a barrel in each department, and so on. I think the issue in question was the November 1938 issue, and I would like to have a copy of this article, too.—JAMES H. ROBINS, *president, The American Pulley Company, Philadelphia, Pennsylvania.*

MR. ROBINS: We were glad to send you clippings of the articles you mentioned in your letter. You were right, the second article, "Employee Teamwork Puts Over Waste Control Plan," appeared in November 1938 issue of AMERICAN BUSINESS magazine.

Salesmen's Cars a Problem

To the Editor:

Please advise if it will be possible to obtain ten reprints of your article, "Business Automobiles—How to Keep Them Rolling," in the March issue of AMERICAN BUSINESS.—J. A. MILLER, *sales department, Brush Division, Pittsburgh Plate Glass Company, Baltimore, Maryland.*

MR. MILLER: This article was not reprinted, but there are still a few copies of the March issue available, if you would care to distribute whole magazines to members of your sales force.

IF UNCLE SAM TAKES YOUR MEN

LET AUTO-TYPISTS

KEEP UP YOUR CORRESPONDENCE

The New 80 Button
PUSH-BUTTON DUAL SELECTOR
AUTO-TYPIST

The loss of Key Men may be making it tough. But this need not cause hardship or delay. With the new PUSH-BUTTON DUAL SELECTOR AUTO-TYPIST you not only overcome man-power loss but you also greatly reduce letter production cost and still have personal letters as "*individual as your fingerprint.*"

War or no war, the over-and-over dictation of the same material is waste that should be eliminated when you can put into standardized paragraphs requests for more credit information, to describe products, or for the collection of money, etc.

With the new AUTO-TYPIST you have your typist cut standard letter material into record rolls, which can be inserted quickly into the machine. Then by merely pushing any combination of buttons (40 in each bank, as shown) you pre-select your paragraphs. Letters are made "personal and individual" by the operator typing in manually any SPECIALLY DICTATED LETTER MATERIAL—name and salutation, a word, amount, sentence, or one or more paragraphs.

While the AUTO-TYPIST is operating the typist can type envelopes, handle a switchboard, do clerical work, or keep several AUTO-TYPISTS busy.

WRITE, OR TELEPHONE US. *One of our four* AUTO-TYPIST *Models can solve your man-power problem and cut costs.*

AMERICAN AUTOMATIC TYPEWRITER COMPANY

614 North Carpenter Street, Chicago — 120 Greenwich Street, New York City

The TREND of Business

as seen by the publisher

SIGNS multiply that business is settling down to a more stable basis. Most of the distractions and dislocations caused by the speeding up of the war production program are behind us. As Chairman Nelson put it: "We have passed the hump." To be sure there are still plenty of headaches ahead—such as labor supply, price inflation, and further curtailment of civilian industries, but these, we feel sure, business will take in its stride. Just as Britain and Canada eventually adjusted their economic life to a half civilian and half war basis so shall we. Except for shipping, it now looks as though President Roosevelt's quota of 45,000 tanks, 60,000 planes, and 20,000 anti-aircraft guns will be topped. Production is really rolling along. Within six months our daily output of fighting tools will enable us to take the offensive on all fronts, and we shall pass from the production stage of the war into the attack stage. That alone will tremendously improve morale and rid business of most of the fears which are now making it so spotty.

The Profit Motive

The Whaley-Eaton Service reports the belief is growing in Great Britain that the government has gone too far in removing the profit motive as an incentive for efficient war production. The new budget, for instance, recognizes this. Britain's excess profits tax has been modified to provide more work incentive. This is interesting in connection with Stuart Chase's new book, *The Road We Are Traveling* (Twentieth Century Fund, New York). Mr. Chase has it all figured out that we are slowly but surely moving from production for profit here in America toward a new system of production for employment. He thinks that the war effort which we are making and the spending we are doing make it impossible for private enterprise to provide post-war employment for 30,000,000 people engaged in war production or in the uniformed services. He may be right. His guess is probably as good as the next fellow's. But one thing is sure, the free enterprise system is a long way from being dead in this country, regardless of what happens in Russia or in Great Britain. It is too deeply rooted in the philosophy of the American people. The profit incentive built America, and, with the exception of the parlor pinks and the soap box artists, Mr. Average American knows it. It will be here long after Mr. Chase has gone to his great reward. To be sure, it will be modified greatly. But nothing better has yet been invented to inspire men to do their best and produce to their full capacity. Certainly state socialism does not have it.

CIO Has a Proposition

If the Congress of Industrial Organization had its way, the profit motive would be made the fifth wheel of a new labor economy in this country right now. It wouldn't wait for the war to end. A ten-point program based on the beautiful thought of equality of sacrifice was publicized in page ads paid for by the United Automobile, Aircraft, and Agricultural Implement Workers of America (UAW-CIO). It was a whooper-do. A ceiling of 3 per cent on war profits; a ceiling of $25,000 on the "shocking" executive salaries; ceilings on food, rent, clothing, and most necessities of life; a moratorium on debts; and other member-getting clap-trap. But the meat of the coconut was the brilliant idea that while the price of everything was to be nailed down, and profits frozen at 3 per cent, there should be an adjustment of wages so that every worker would receive the minimum of a dollar an hour! Considering that the average wage in the war production industries is about 77 cents

an hour, all the CIO wants is a 20 per cent increase. "Upon the acceptance of these conditions," the advertisement states, "and adoption of the foregoing measures, we agree that all wages for time over forty hours shall be paid in the form of non-negotiable special defense bonds. This will mean a tremendous source of income for our Government for financing the war effort." Now isn't that something? For a 20 per cent increase in wages, which would of necessity come out of the Government's pocket, at least so far as war production is concerned, the big-hearted UAW agrees to take bonds instead of cash for all time worked over forty hours a week!

Post-War Reserves

The irony of this CIO blast of self-righteousness is that it would hit labor harder than it would hit capital. Take the 3 per cent ceiling on profits. That sounds reasonable. But who would get the worst of it? To be sure stockholders would have to go without dividends or be satisfied with less. But they could take it. They have been taking it now for ten years. But what about the workers in the war production plant, when the war ends and the plant has to be converted from war production to peace production? If the business is going to be squeezed between a 3 per cent ceiling on profits and a 20 per cent increase in wages, where is the money coming from to accumulate the reserves needed for payroll during the adjustment period? In addition to the usual reserves to cover wear and tear on the plant and machinery, there must also be reserves to cover canceled contract losses; inventory losses; rearrangement of facilities to manufacture new products, to say nothing of reserves to finance new accounts while everything is going out and very little coming in. Unless a company is allowed a margin of profit adequate to provide these needed reserves, it will have no choice but to close down the plant and lay off its workers. To be sure, the workers have their federal unemployment insurance, but how long will that last? Besides the American worker wants a job and not a dole. But he will have to go on the dole if his unions succeed in their nit-wit program to leave the company no backlog against the inevitable rainy day that lies ahead.

Labor's Better Side

But don't jump to the conclusion that all unions are quite as pixilated as UAW-CIO. In the last year I have met across the conference table a great many of labor's leaders. Some of them are just a pain in the neck. Most of them are honest, sincere, and capable. They will admit, off the record, that the present selfish attitude some unions are adopting during this emergency has them worried. They don't like the jurisdictional wrangling and sniping. They realize too well that labor is making the same mistake that business made in 1929. When business became callous to public opinion, a storm broke over its head that it will not soon forget. Only now is it beginning to get back into the good graces of the public. And so it will be with labor. Just as good business suffered for the sins of bad business, so good unions will suffer for the sins of bad unions. And the good unions know this. That is why there has been introduced into Congress H.R. 6777 to regulate labor unions by amending the National Labor Relations Act. This bill is being sponsored by the Railroad Yardmasters of North America, Inc., an unaffiliated organization. It provides that only U. S. and Canadian citizens shall be eligible to hold office in a labor union; officers or leaders shall be bonded; the union shall publish an annual financial statement certified by a public accountant; a cooling off period of sixty days before striking; no interunion strikes; and other conditions which must be met before the union would be certified as bargaining agent by the National Labor Relations Board. This bill will probably never get out of the Committee. But it is a step in the right direction.

Mobilizing Public Opinion

As one who sits at the receiving end of the endless stream of press releases which pour in from all agencies of government, we are amazed at how many words can be used to say nothing. You read one release and are convinced that the country is on the verge of ruin. We are called upon for more and bigger sacrifices. The next release is full of cheer and praise for the wonderful strides we are making in meeting President Roosevelt's production quota. In one breath we are told that production will win the war; in another that transportation will win the war. And so it goes. One gradually but inevitably reaches the conclusion that our muddled public relations is just about on a par with the production muddle before Don Nelson took over. Modern war is quite as much a matter of winning the home front battle as it is the front line battle. And to win any kind of battle there must be direction, and coordination of effort. One hesitates to suggest as a remedy setting up another board. Washington is already dizzy with boards. Perhaps a better way might be to take some of the various publicity departments of the existing boards, as well as the Office of Facts and Figures and any other loose ends lying around, and merge them into an overall Public Relations Board. Then, when all the sheet writers and Mimeograph twirlers are rounded up, run them through a separating machine and let about half of them go back home and go to work. In place of these word slingers, man the new agency with a staff of experienced public relations men who really know what makes public relations tick. If there is one thing public relations isn't, it is the kind of pitter-patter that comes rolling out of the Mimeographs down in Washington.—*J. C. A.*

"Drop in some morning about 10:30, McGinnis,

and I'll show you a traffic jam!"

"Sure, Mac, I know—you run up against parades, football crowds—and a World Series now and then. But we're handling traffic jams every day.

"This war is taking some of the traffic off your beat and putting it on mine—taking it off the streets and putting it on the telephone lines.

"And we're getting short of materials. The stuff that used to make switchboards and cables now goes to the shooting part of the war.

"But we've found the public good-natured and helpful just as you have. The trouble began with Hitler and will end when we finish with him."

LONG DISTANCE *helps unite the nation*

This Hullabaloo About Profits

It is time for business to speak up and tell its side of the story. CIO unions and many Washington spokesmen are clamoring for various schemes to deprive industry of profits needed to enable it to survive the readjustments and return to peacetime operations

BY JOHN GARTH

PLANK number one in the UAW-CIO master program for winning the war reads:

END ALL WAR PROFITS. Establishment of a rigid ceiling on, and control of, profits on the basis of 3 per cent return on actual capital invested. All the corporate earnings over 3 per cent to revert to the Government. The shocking evil of exorbitant corporation "bonuses" and salaries must be ended.

A senator from Texas wants to limit all profits during wartime to the average of yearly profits for the previous five years. Another senator wants to limit profits to 6 per cent, taking away 99 per cent of all profits above this figure.

Before we comment on these proposals, suppose we consider a case of alleged "profiteering" during the previous World War, which ended on November 11, 1918. On this date a certain munitions maker had 22,000 people on the payroll. The plant had been vastly expanded, and the corporation had been forced into heavy financing to carry on its wartime manufacturing program.

For about eighteen months the company sold nothing to its regular customers. Its salesmen were discharged and it had no wholesalers or dealers. Day after Armistice came a telegram from the Government stopping all work and canceling all orders. Here was a giant company, which people thought was earning tremendous profits in wartime, with no customers, no orders, no salesmen, and facing the necessity of conversion back to peacetime business.

What happened to this great company? First, it went to the banks for help. It had to redesign almost all of its civilian products. That took time. It had to rebuild, as best and as fast as it could, its field sales organization. That, too, took time and money. It had to reorganize its factory for the return to civilian production. It tried to bring out new lines to take up some of the vastly increased manufacturing capacity.

Before the company was back into normal civilian manufacturing, the bank was dictating its every move. It consolidated the great manufacturing company with a great distributor, which had also gone to the same bank in an attempt to tide itself over inventory losses which began occurring in 1919.

Here were two great companies, both war casualties, trying to stage a comeback into civilian business life. Neither quite succeeded. The merger did not jell. The two companies were unscrambled. The sequel, not to take too long to tell a tragic tale, is that a small competitor finally bought out the great manufacturer, and a large competitor finally took over the great distributing organization.

Both companies were accused of earning extravagant war profits, yet neither company had enough money to survive the dangerous aftermath of war.

Suppose we look at another company's experience after the war. This company had also gone all out for war. It had, at the Government's request, stopped making anything for its civilian customers. When the Armistice was signed, it too received word to stop manufacturing on war contracts. Months later government men came in and inspected the company's inventory, its work in process, and made an offer to the company which was reluctantly accepted. After the company disposed of its war products salvage as best it could, the books showed a million dollars' net loss as a result of working to help win the war. All so-called "war profits" were wiped out and the company had to dig into its corporate reserves to the tune of a million dollars to pay the bills. The loss of a million dollars was a severe setback to this company. Although it survived, the

million-dollar loss delayed the company's march back into civilian life—it meant idle machines, it meant that ex-soldiers and sailors were deprived of work—it meant that men returning from camps and foreign battlefields came home to find a "No Help Wanted" sign over the factory entrance which they had left to join the Army or Navy.

One more look at another business tragedy. Roll back your memory to the slogans of the other war: "Food Will Win the War," "Meatless Days," "Wheatless Days," "Save Wheat for Our Allies." In an effort to provide food for the nation and our allies, Armour and Company piled up the largest inventories in its history. The company was a great unit in our World War effort.

After the Armistice, Armour and Company is said to have lost a million dollars a day for a hundred days. How the company survived is one of the business marvels of the age. The fact that it did survive, even though the chief owners lost everything, is beside the point here, as are the personal misfortunes of the Armour family. The facts we want to consider here are plain—there can be no such thing as an absolute profit in wartime. Even though a company earns large profits for the duration of the war, it may, and probably will see those profits literally wiped out soon after the postwar readjustment begins. Then, what looked like a tremendous profit may melt away so fast that the company would have been better off never to have engaged in war work. But every well managed, farseeing American company is willing and anxious to engage in war work. But every company owes it to itself, its stockholders, and to our country's welfare to survive if it can. If we wipe out profits in a mistaken idea of sacrifice, haven't we wiped out one of the things we are fighting for?

The three cases cited here are but three of hundreds of similar cases. There were many businesses which did not recover from postwar losses. True, there were some which made exorbitant profits. But are we to undermine the business foundations of America to prevent a few profiteers from keeping ill-gotten gains?

As this is being written the press and the radio and the political leaders of the country are whipping our people into a frenzy of emotion about "war profits." One senator has introduced a bill to limit profits to the average figure of five previous years. Another senator would limit profits to 6 per cent of invested capital. Many leaders seem to feel that profits have become wicked.

It is unfortunate that this outcry has been raised at a time when many businesses are struggling to survive, because the survival of business is as necessary to insure a strong, virile, prosperous America as is the survival of our liberties in other phases of our national life. Without a strong, expanding, healthy business structure after the war, will we not have fought the war in vain?

We, as a nation, cannot outlaw profits and expect our returning soldiers to come home and find the jobs which were so fervently promised to them when they left. The returning soldier may well wonder what his fighting won for him if he comes home only to walk the streets hunting for a job.

Most of the outcries against profits are carefully worded to appear as if the opposition is only objecting to excessive profits, but the rub comes when "excessive profits"are defined. That there can be no justification for excessive profits during our country's fight for its national existence goes without saying. No one wants any corporation or individual to salt away excessive profits while our men are fighting all over the world. Nor can we find any way to justify some profits that have been made. Perhaps it was the Jack and Heintz case, or some of the cantonment building profit cases turned up by the Truman investigation which brought on this agitation against profits. Whatever caused the outcry, there is considerable danger that business will be deprived of the right to earn enough to permit its survival after the war, unless business can state its case convincingly enough to bring the lawmakers down to earth.

Everyone is familiar with the difficulties, the delays, the expense, and the mistakes encountered in changing over from civilian to war production. When the time comes to change back, from war production to civilian production, the delays may not be so great, nor the expense so burdensome. In this case the manufacturer will be returning to operations and products with which he has had previous experience. But it will be a costly, laborious, difficult process nevertheless. But the big expense may come, not in switching back to civilian production, but in rebuilding a sales and distributing organization, to move the products of his vastly enlarged factories.

It is one kind of problem to return to civilian production—still another to rebuild selling and distributing organizations. The selling machines of most large manufacturers were built up, one man at a time, one branch, one salesroom at a time over a period of years. Tremendous costs have been involved because building a sales organization is a long process of costly trial and error. Where will the money come from to rebuild these sales machines if the Congress puts into the laws of the land some of the dizzy prevailing ideas about what constitutes fair profit?

There will be little employment for the UAW-CIO, AF of L, or anyone else in the factories after the war until sales, service, and field organizations are recruited, trained, and reestablished. Some of the industries which are the greatest employers of manpower will have to establish new dealers, new salesmen to sell those dealers, new branch and district organizations. The dealers will have to hire, train, and organize sales and service or-

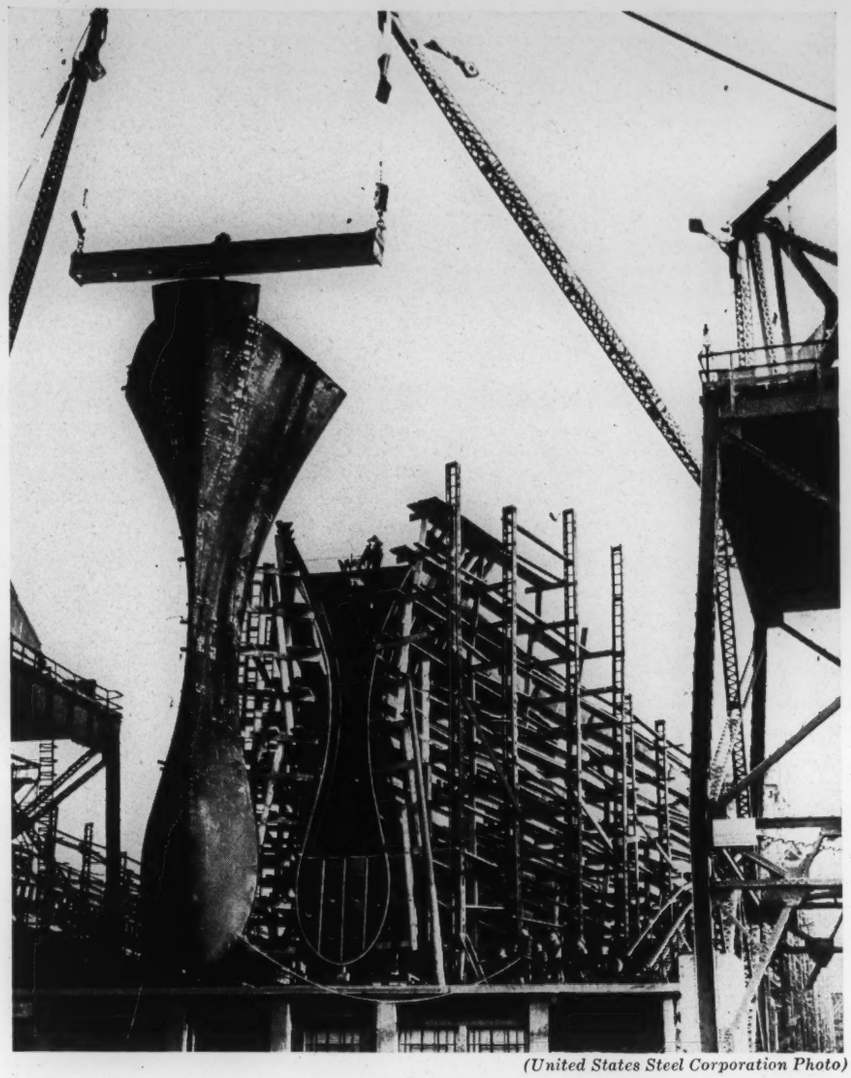
ganizations. Even though, as some people think, the demand for goods will be tremendous, selling and servicing will still be necessary before business rights itself and proceeds with peacetime employment.

All of these activities will eat up capital rapidly. The very speed at which we reestablish peacetime business will depend to some extent at least upon the ability to provide capital. And everybody (except possibly Senators and Congressmen) knows it is extremely difficult to finance a business which has not been earning adequate profits.

Our war industry in this country is civilian industry converted in the emergency to war production. We have no industry in America dependent on wars for business. Considerable misinformation was spread throughout the country after the World War to the effect that the "munitions millionaires" got us into war. This misleading claim was the granddaddy of all our ill-timed peace propaganda, which continued to hypnotize our people to the point where we refused to face realities.

If we had a vast, powerful, sinister munitions industry in America, engaged in fostering war and revolution to produce munitions orders, there would be some sanity in attempting to deprive such an industry of profit. Actually the war mongering "munitions giants" are almost entirely creations of the blood-and-thunder school of fiction writers. At any rate, whether they may have existed in Europe or not, we have no such creatures in America.

Today our munitions industry consists of companies geared to produce automobiles, passenger planes, washing machines, refrigerators, and other such innocent devices as merry-go-rounds and chewing gum vending machines. We believe it wholly true to say that each and everyone of these manufacturers now engaged in war production would be far happier if they were *(Continued on page 36)*



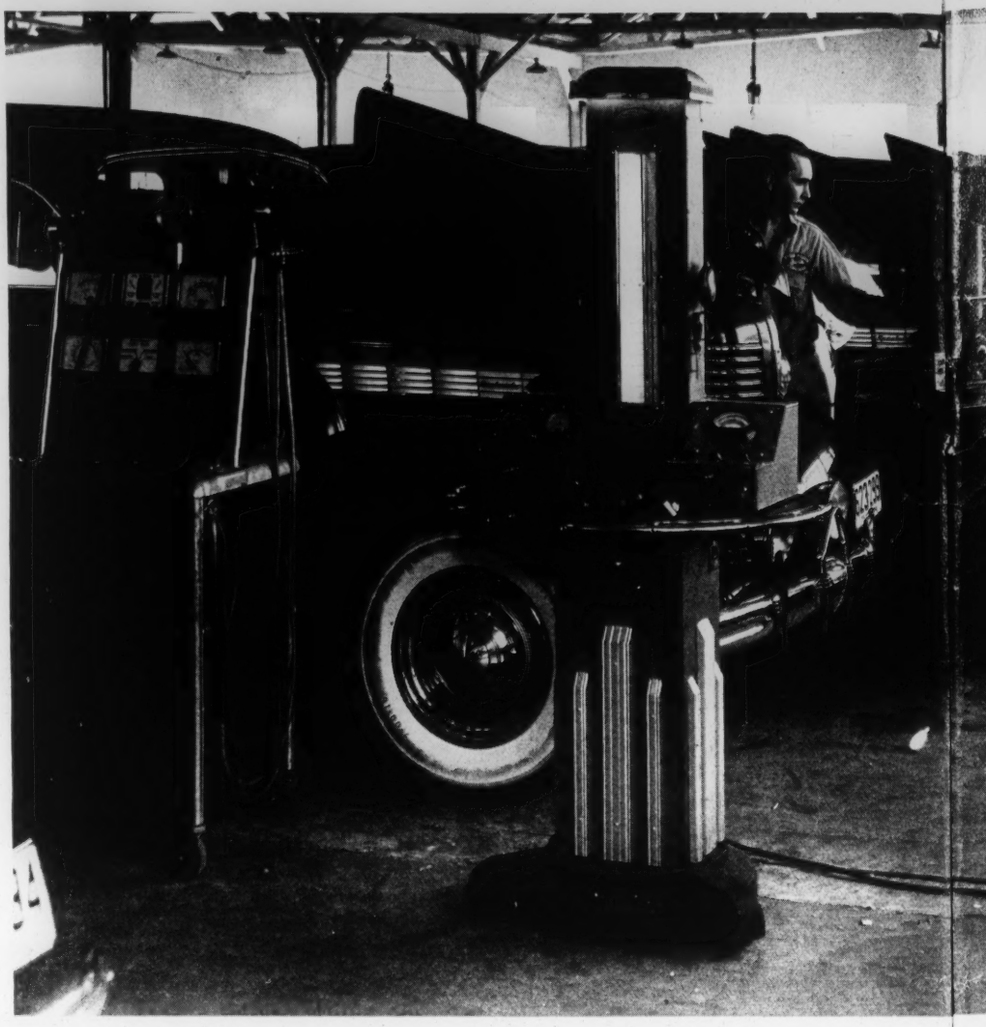
(United States Steel Corporation Photo)

A welded bow section of a new tanker being erected on a shipway. Here is an example of innovations and speed-up methods devised by industry to win the war

Workers and Taxes First

For every worker employed by one great corporation sales were	**$5,336**
From this sum workers were paid *(This includes salaries, wages, pensions)*	**1,990**
The Government took for local, state, and federal taxes	**629**
For wear and use of facilities the company retained	**315**
For interest on borrowed money the company paid	**20**
For raw materials, services, and supplies the company paid	**2,000**
The company retained for future needs (rebuilding, repairs, expansion, etc.)	**185**
Which left, for dividends for use of facilities	**197**

This case history of the experience of Earl North Buick Company holds hope for other dealers who may utilize sales force and equipment to get into new fields or win war work



Earl North's Buick sales and service plant in Houston, Texas, was one of the best in the So here, it is filled with sheet metal working machinery to handle war contracts and fill orders for

War Work for Automob

BY CHARLES N. TUNNELL

WHEN it was finished three years ago, the Earl North Buick Company building in Houston, Texas, was said to be the finest automobile agency building in the South—62,500 square feet of floor space all under one roof, occupying an entire block of ground. This automobile agency building contained a big showroom, air-conditioned waiting room for customers, a customer's service department, and a new car service shop equal to the best in the country.

But Pearl Harbor sounded taps temporarily to the new car business. Earl North had 185 employees—all trained in their field of the automobile business. He immediately set to work to build up his service business to help offset some of the volume lost from new car sales. He succeeded to the extent that service sales for the first three months of 1942 exceeded service sales for the same period of 1941. But service alone will not carry a big dealer organization.

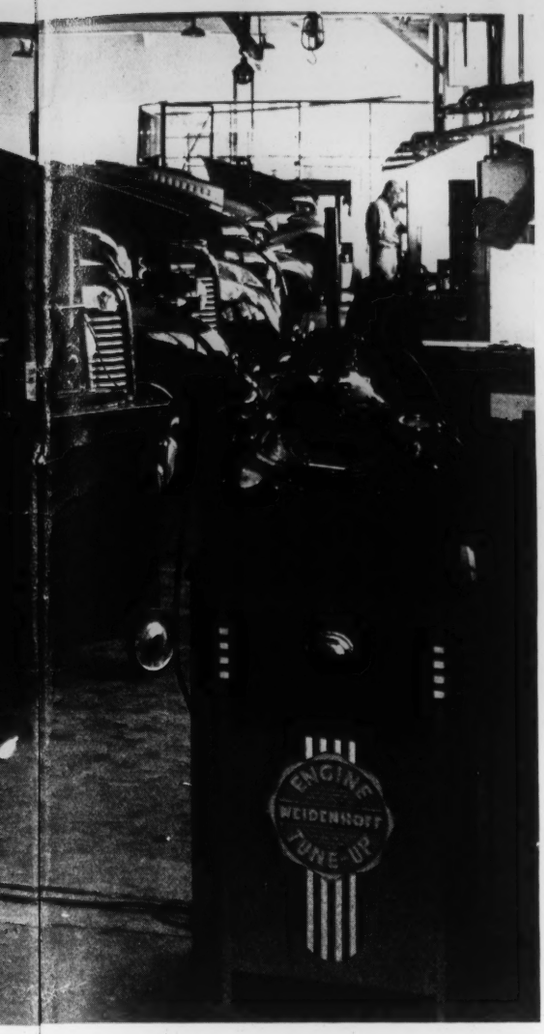
Mr. North, like many small business executives, wanted to convert his business to wartime production. Senators and Congressmen were contacted and told that the North organization, with ample capital to finance itself, wanted to work for Uncle Sam. Boards and bureaus were contacted. The forerunner of the WPB was contacted in person by Earl North's general manager in Washington, and other governmental agencies were contacted personally in St. Louis. "We have ample floor space, a modern building, 185 loyal and highly efficient workers, ample capital of our own—now what can we do?" was a stock question.

The answer was always:

"Thanks for the fine spirit—but you have no production facilities. You are simply an automobile distributor, not a manufacturer. We have thousands of small manufacturing plant owners anxious to serve the Government in the defense program, and it is hard enough to find places for them."

A month of sweating. Nothing happened. There was no use waiting longer for instructions from Washington. A ready-made plan would have to be developed and laid before the governmental agencies and before prime contractors. By personally contacting some of the larger governmental contractors, it was found that some of the subcontractors were being overloaded and unable to turn out all the contracts fast enough . . . one such field being in the sheet metal industry.

The equipment in one sheet metal shop and other new and used equipment was purchased. Within forty days the Earl North Buick Company's new car service department had been closed off into 8,000



the Southwest. Now, in place of the equipment seen
ders for chemical products made under a license plan

obile Dealers

square feet of manufacturing space for the Earl North Sheet Metal and Tool Works and the first contract was well on the way to delivery. Incidentally, this first contract amounted to only $1,000 or so, but it received the okay of the Navy Department. It was for metal cases to hold pistols and other small arms for sub chasers under construction in the Gulf Coast area. Then invitations to bid on other jobs began to come in, and direct agreements were reached for contracts and subcontracts for such things as 55-gallon oil drums, 5-gallon gasoline cans used by the Navy, metal liners for wooden cases used for shipping shells and ammunition, all types of sheet metal work in ships, sub chasers, and other machines.

Retooling has been the anchor on many conversion jobs for war production. This automobile dealer foresaw this difficulty and the first installation was equipment and all facilities for making dies, tools, and precision instruments. Now all gauge metal up to 6 gauge can be cut, and bending and braking equipment handles metal up to 15 gauge. One 250-ton press is used, two smaller presses are operated. All spot and electrical welding, lathe work, etc., are done right in the shop.

Although practically no equipment used in the automobile shop was of value to this new line of production, the welding, painting, etc., materials and facilities were transferred; and the experience of shop men proved to be a valuable asset. Out of the 185 employees, 80 to 90 of them were in the service end of the business. Immediately, ten men from the new car service shop were transferred to this new sheet metal works along with the general service manager, R. A. Parker. Charles A. Nichols, an experienced sheet metal shop manager, ex-Navy man, and shipbuilder, was brought in as shop superintendent and with him came some skilled workers. At least fifty workers will eventually be used in this shop, most of them recruited from the ranks of Earl North automobile mechanics. Some of these mechanics have gone into other war work, four of them going to the Army as mechanical instructors in carburetion, ignition, and other technical work.

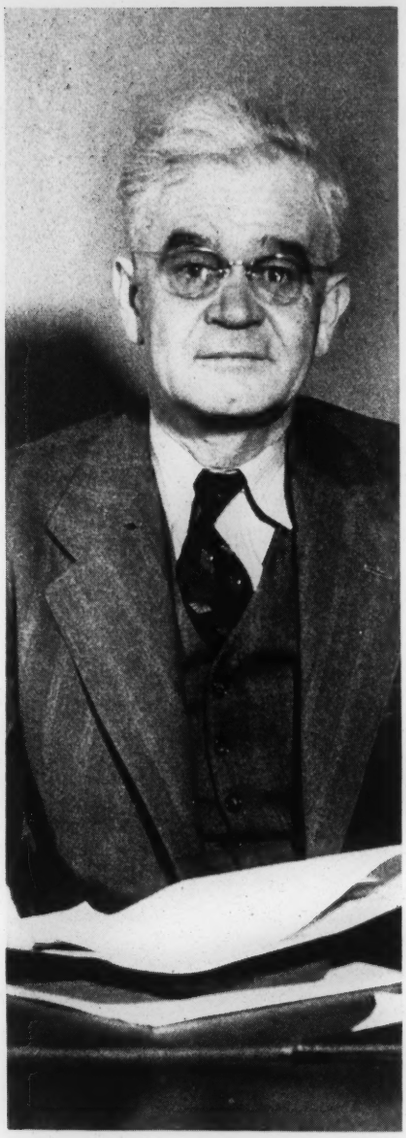
While this automobile dealer was investing $150,000 in a new sheet metal and tool works to work into the war production program and to help take care of some of his organization, he had feelers out in other directions, too. He wanted something that would give employment to the salesmen, office workers, and others not skilled in mechanical production—yet something of a nature that contributes toward the war program.

Harry Smith, a representative of the Kelite Company of Los Angeles, walked into Earl North's office looking for a good salesman to take over the Houston territory because he knew that many good automobile salesmen were being forced out of work. This automobile dealer could visualize employment for more than one man and direct aid in the war program by reducing transportation, etc. F. L. Alexander went to California and after two weeks of thorough investigation, the Kelite Company had a new submanufacturer, the Earl North Kelite Company of Texas, the first and only submanufacturer established by this firm.

Across from the main automobile building operated by Earl North is the used car building with some 10,000 square feet of floor space. It was formerly the used car shop. Today, chemicals are being mixed and manufactured there. In less than 60 days, 4 or 5 of the 127 chemicals manufactured by Kelite were being produced in the Houston plant with actual physical investment of only some $10,000. Other Kelite products are being distributed from the Houston plant while formulas for their manufacture are being worked out with Earl North employees.

Ten or twelve of the new car salesmen for Earl North Buick Company are now Kelite salesmen after having taken two weeks of intensive sales training and demonstration work from Mr. Smith, the Kelite representative. From these salesmen, men will be selected to manage branch offices in Dallas, San Antonio, New Orleans, and other southern cities—especially in the vicinity of war work, for Kelite products are used in washing down airplanes after so many hours of service, in scouring machine parts, cleaning and cutting grease, cutting skum and grit from roads and runways, dish washing powders for institutions, special soaps and chemicals for hospitals, schools, machine shops, etc.

How 19 Small Plants Found War Work Contracts



Harrison B. Judd, the engineer who took hold of the San Jose, California, group when it was floundering in its attempt to obtain war contracts, developed the methods which finally brought work and success to the cooperative organization

After false starts and discouragement a group of little plants in San Jose, California, perfect an organization which is doing good war work and handling a large volume of work, with profit, satisfaction to all concerned

BY ANDREW R. BOONE

IN JULY 1940—eighteen months before the Japs dove over Pearl Harbor—the San Jose, California, Chamber of Commerce, through its industrial division, surveyed all the small machine shops in its metropolitan area. The exact number available for production of military goods is a military secret. Information collected revealed these facts: Type of machines, number of men employed, floor space, type of work normally produced, and the possibility of expansion both as to space and personnel. Brochures containing this information were mailed out to Pacific Coast aircraft manufacturers and to various government agencies, as a solicitation for work. Results: Nil.

Two months later, discouraged by this early experience, the Chamber called Harrison B. Judd into the picture. An able engineer, Mr. Judd immediately saw that mail-order solicitations would never bear fruit. He began jumping around the country, visiting aircraft manufacturers, Army ordnance at San Francisco, Army officials at Washington, and the OPM. One day an Army officer came to San Jose and in a speech confirmed the soundness of Mr. Judd's approach. "You may have the best possible facilities," said the visitor, "but the Government won't know about them until you tell your story. You must sell your idea."

"And that," Mr. Judd tells you, "is exactly what we have done. Everywhere we preach the combined ability of our shops and the capability of our skilled machinists."

He organized San Jose Manufacturers, Inc., and started bidding on contracts. He missed several. Then he hit on the proper combination for 300 gun carriages . . . $2,000,000 in round figures . . . and got it. Production is now under way.

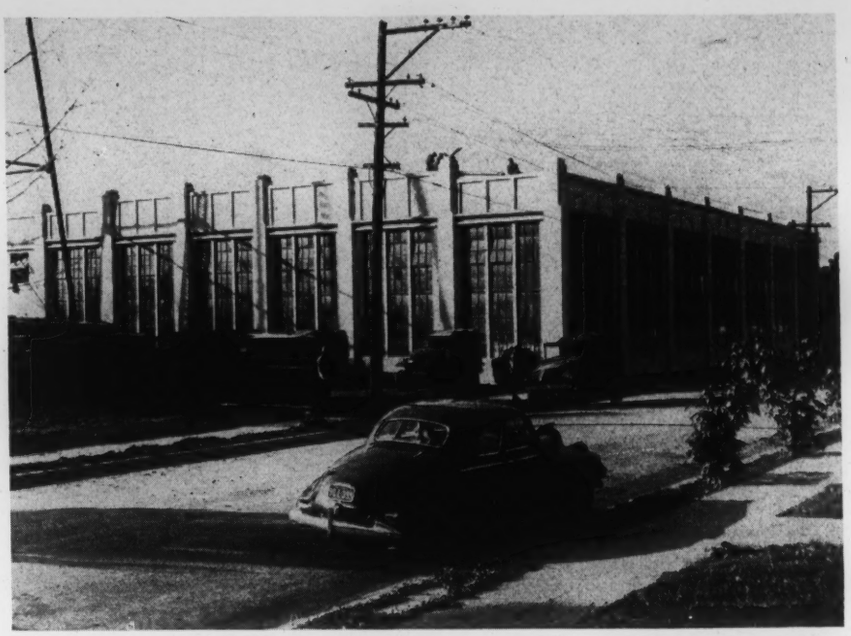
Here's how the production works out: San Jose Manufacturers, Inc., the parent organization and prime contractor, figures costs and enters the bid. Once awarded, parts of the work were parceled out to nineteen shops. Raw materials come into the forging department, where initial work is undertaken. From here, the parent organization parcels out the parts to the several shops. When their job is done, again the prime contractor picks them up, hauls them to an abandoned laundry on the edge of the city, where they are finally assembled into the completed carriages. From there they move on to the Army.

The forge and the assembly plant may be considered the key to the project, for—to obtain contracts, the prime contractor must possess actual productive capacity. No "under your hat" bidding as far as the Ordnance Department and WPB are concerned. So, Mr. Judd arranged for installation of seven drop hammers in the forge building, necessary tools in the final assembly building. Those institutions set up and ready, he could guarantee both control of the individual departments, represented by the shops, and overall production represented by the two aforementioned.

Contracts between the Government, prime contractor, and subcontractor provide for definite schedules of prices, based upon the machine hour and minimum rates of production. Title to special tools is vested in the prime contractor. Labor is protected by contract providing for pay increases as costs of living advance. No subcontractor may "steal" another's employees.

Thus far, harmony prevails in San Jose. The plan works smoothly. Except for geographical locations, Mr. Judd heads a single firm, departments on the gun carriage contract being housed under twenty-one buildings instead of under a single roof.

Mr. Judd took a leaf from the California fruit growers cooperatives in setting up the San Jose organization. It is a corporation without capital, yet for practical purposes its credit is unlimited. The charter authorizes 100,000 shares of capital stock. When production was started on the gun carriage order, the shares were distributed to the parent firm and to the participating firms, principally to the latter. Acceptance of a proportion of the shares did not, however, involve any consideration on the part of the individual plant. Yet to retain his shares beyond the first contract, each subcontractor must participate in subsequent contracts. Should his participation not extend beyond a single contract, he must relinquish his stock while retaining an interest in it.



Parts—"bits and pieces" as the British term goes—made in scattered plants in and around San Jose will be assembled in this plant, leased for the purpose

Participation in payments and profits is simplicity itself and may well be adapted by small machine shops in any locality. On completion of the gun carriage contract, for example, one-third of the profits will be distributed in proportion to the work performed by each participant. One-third will go to the participants according to the amount of stock assigned to each. The final third will be kept by the association for use as a revolving fund or working capital.

Let's say the Jones Manufacturing Company is one of the nineteen firms producing some of the two hundred odd parts going into the finally assembled gun carriages. Jones has been assigned a fairly thin slice of the total, say $12,000. He has got the job on a cost-plus-10-per-cent basis. He completes his job to the satisfaction of the parent association, the WPB, the Army ordnance department, and is entitled to his cut in the profits. On the cost-plus basis, he earns $1,200. Of this, he receives a check for $400 immediately. Of the next $400, he receives a share in proportion to the number of shares he holds. The final $400 is then transferred to a revolving fund held by the association until final dissolution . . . perhaps not before the war ends.

Why doesn't Jones get the full $400 of the second allocation? For this reason: The prime contractor handles all managerial responsibilities, such as purchasing, routing materials, and general business functions, as well as final production and assembly. Thus, as prime contractor, the association is assigned a larger proportion of the stock, the balance being cut in proportion to the amount of work done by each member plant.

Equality of production is attained by the prime contractor, who, with full knowledge of the capabilities of member plants, allots the various parts of the contract to the most efficient firms on those particular pieces. A rate per hour per machine is agreed upon by member plants, which receive a minimum number of pieces to produce each hour. If a plant produces more per hour than has been planned it receives the benefit of its efficiency. Should it produce less, the plant must up production to the minimum or forfeit its interest in the contract. Should this con-

tingency occur, other plants will be taken into the cooperative to fill the vacancy.

In addition to the hourly rate, each plant shares in the profits, dividends, and increased assets of the association.

Financing such a plan has offered some difficulties. Whether the method worked out at San Jose can be made universally applicable remains to be seen. Mr. Judd was informed the Government would prefer his group to handle advances for tools, equipment, working capital, materials, and other early expenses through local banks. Mr. Judd has found this plan makes available finances that are at once limited and unlimited. Limited, in that the bank will supply no funds not actually needed for those purposes. Unlimited, in that, given a contract and satisfactory production costs, the association can get all the funds it needs.

For example, a San Jose bank loaned the association money with which to buy drop forge hammers and other equipment. Covering the loan is a note signed by both the association and all its individual members as well.

San Jose needed such a plan. There was the matter of machinists, home owners, taxpayers, consumers, leaving the city for employment in San Francisco, Los Angeles, and elsewhere, where wages higher than prevailing in small shops dependent upon day-by-day small orders are being paid. Small shops, in the absence of war work, were facing drastic restrictions in materials. In many cases, doors soon would be closing for lack of raw stock. How could the capable men be kept at home and be available for normal pursuits when the war ends? By just such an association as is now functioning to everyone's satisfaction.

San Jose's workers are at home, contributing increasingly to national defense. And there's no noticeable slackening of efficiency due to their geographical spread in small plants. Their work doesn't prove defective more than once, and they don't fail to meet specifications more than once. Should any such fall-off occur, the prime contractor simply notifies the small shop of the parent company's intention to cancel the contract. The shop operator has ten days to begin producing in accord with specifications laid down by the Ordnance Department. If he fails, he's out and another takes his place.

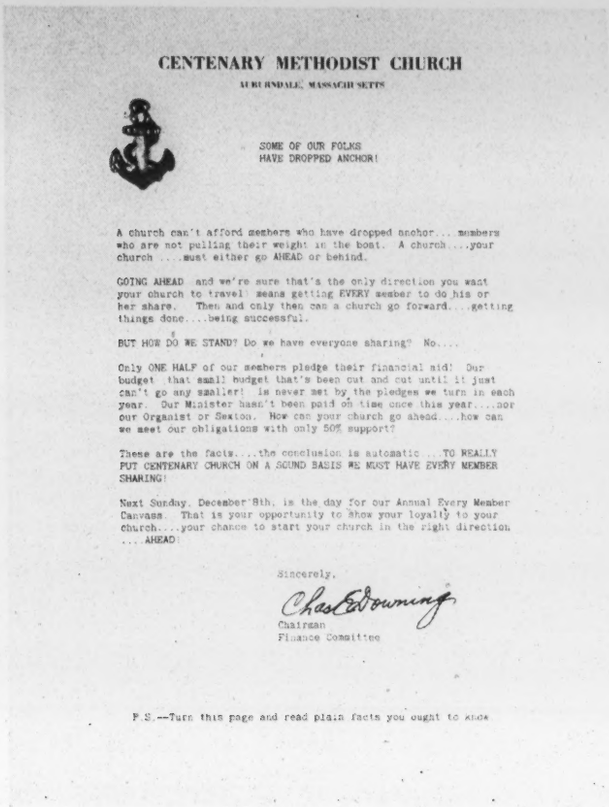
Sum total of the whole scheme is on-time production at rates of compensation fair to government, employer, and employee. Contracts between the various parties, from Uncle Sam down to the labor union, see to that. For a city of the San Jose type, not blessed with large individual manufacturing units, Judd's plan is proving entirely workable. After all, it is producing gun carriages. That seems to be the test. That many similar attempts elsewhere have failed seems to prove that war work demands the same skill we expect in civilian production.

As many as 45 per cent of all cartons shipped are split, according to some big shippers. Before the development of this new, divisible carton, the only way to keep cans from tumbling out was by tying pieces of string about each individual section

Shippers Aided By Split Cartons

TO MEET the problem of keeping cans from tumbling out when a carton is split, Rumford Chemical Works has developed a new carton. Around the outside of the standard size, twenty-four-can carton runs a line. By slicing along the line, a jobber can split the carton and obtain two separate complete units. Printing on the inside walls of the divided sections reads "Half Case, One Dozen." The new carton is considerably stronger than the old type, due to the reinforcement of the interior wall in the center.

Here is another effective idea, so simple that one wonders why someone didn't think of it before.



CENTENARY METHODIST CHURCH

AUBURNDALE, MASSACHUSETTS

SOME OF OUR FOLKS
HAVE DROPPED ANCHOR!

A church can't afford members who have dropped anchor... members who are not pulling their weight in the boat. A church....your church ....must either go AHEAD or behind.

GOING AHEAD and we're sure that's the only direction you want your church to travel means getting EVERY member to do his or her share. Then and only then can a church go forward....getting things done...being successful.

BUT HOW DO WE STAND? Do we have everyone sharing? No....

Only ONE HALF of our members pledge their financial aid! Our budget that small budget that's been cut and cut until it just can't go any smaller! is never met by the pledges we turn in each year. Our Minister hasn't been paid on time once this year....nor our Organist or Sexton. How can your church go ahead....how can we meet our obligations with only 50% support?

These are the facts....the conclusion is automatic ...TO REALLY PUT CENTENARY CHURCH ON A SOUND BASIS WE MUST HAVE EVERY MEMBER SHARING!

Next Sunday, December 8th, is the day for our Annual Every Member Canvass. That is your opportunity to show your loyalty to your church....your chance to start your church in the right direction ....AHEAD!

Sincerely,

Chas Edwards

Chairman
Finance Committee

P.S.--Turn this page and read plain facts you ought to know

BASKIN

CHICAGO • ILLINOIS

Dear Sir:

You know how it is with a

It's easy to puff one up with hot air. But one little weak spot, or one little jab and -- pouf -- what have you got? Not much of anything!

Clothes quality is something like that! Any amount of blowing and puffing about value, quality, etc., won't put all these things in a garment unless they're really there to start with!

And that goes particularly for a topcoat...because topcoats today are being subjected to more strenuous wear than they ever have been before.

We've got just the answer to your topcoat problem for fall. It's a new coat we're featuring called -- MOTORCOAT!

Motorcoat is made of a fine, sturdy, gravenetted fabric that will wear and wear and wear. It's a smart-looking, smooth finished coat that has worlds of style and will hold its shape under the most trying of conditions.

Most of us spend a lot of time in our automobiles today and actually this new Motorcoat of ours was developed to take the hard wear you give a coat getting in, getting out of and sitting in a car all day long while you're driving it.

Motorcoat is styled and tailored by Hart Schaffner & Marx. That in itself is your assurance of quality, and smartness. Add to this the all-inclusiveness and style rightness of our selection - which features a wide variety of new fall colors and models and we believe you'll agree that Motorcoat is the outstanding coat buy of the season. (Its price? - Only $30.)

Very truly yours,

BASKIN

THE HOME OF HART SCHAFFNER & MARX CLOTHES

Gadgets, Tricks, and Puzzles to Make Letters Pull

SENDING out 325 letters a month to people who had pledged contributions to a church, an advertising man who was the church treasurer was worried because some months not a single reply was received to his appeals.

After several disappointments he obtained a supply of miniature anchors, fastened them in the upper left-hand corner of the letterhead, and built a letter around the idea, "Some of Our Folks Have Dropped Anchor." The letter pulled $1,000 within a week. It was a simple dramatization of an idea which had been stated in many other less successful letters.

The same idea could be used in a collection letter, or in a letter to association, lodge, or club members. There are many simple gadgets available for the purpose of adding extra attention-getting value to letters. The anchor letter and another with a small balloon are illustrated above.

Recently 10,000 letters used in a charity drive went out with chicken wishbones attached near the top of the letterhead and a letter built around the "wishing" idea. The results were excellent.

Hart Schaffner and Marx has developed an entire series of letters for its dealers built around gadgets. One uses a nail puzzle, another a lantern with a red "globe" made of plastic, still another a miniature football. Among the miniatures available, at prices which do not make the cost of letters prohibitive, are claw hammers, a pair of dice —all fives and twos, so that every throw shows up "sevens." There are also short pencils, old-fashioned handle bar mustaches, horseshoes, lanterns, blue chips, and simple puzzles.

Obviously, the gadgets themselves are not a guarantee of success. The letters must "fit" and be appropriate to the gadget, and the idea must not be "dragged in by the seat of the pants." If it is well done and carries out the suggestion of the gadget, there is considerable evidence to show that results are increased far beyond the extra cost of the gadgets and the extra handling incident to attaching them to the letters.

The editors will be glad to advise readers where supplies of these gadgets, tricks, and puzzles may be obtained.

Ample supplies of drugs and medicines are kept on hand to meet every conceivable emergency or need when it occurs

This shot of one of the instrument cabinets shows how well the clinic is prepared to give instant service to patients

GUARDING EMPLOYEE HEALTH

Pepperell Manufacturing Company's new health clinic for employees at Biddeford, Maine, plant shows trend of industrial medicine toward prevention as well as treatment. Medical departments now play important roles in industry's effort to improve working conditions

SOME years back when business and industry first began employing medical examiners to examine applicants for work the idea was, of course, to select good, healthy physical specimens, to insure selection of men and women who had no contagious, infectious, or dangerous diseases.

For many years the "company doctor" was not regarded especially high. Many employees never consulted a company doctor voluntarily. Because of the age-old suspicion between employee and employer many companies found that efforts to extend the usefulness of medical departments were resented by employees. Somehow or other, in some plants, company doctors were considered none too friendly to the employee. They were on the other side of the fence from the worker. That much of this attitude was wholly unjustified and based on hearsay and prejudice made no difference. Then it was difficult to induce employees to report to the medical department in the event of accidents. They especially hated to report small or trivial accidents, some of which often developed into more serious cases than the employees first expected.

Gradually the medical men won the confidence of most employees. Better relations between employee and employer wiped out the remaining hang-over of doubt and suspicion, and employees learned that company doctors were their friends, not their enemies.

In recent years, in line with trends in private medicine, the medical departments of leading companies have undertaken the practice of preventive medicine. The idea, in many modern medical departments of business, is to keep employees well—not to wait until they hurt themselves or fall ill before going into action. Medical

departments have tackled the problem of lost time and in some cases have been highly successful in reducing absenteeism. Today in many companies it is a rule to report directly to the company doctor or medical department when remaining away from work. Frequent consultation, good advice, and a friendly attitude have brought many company medical departments into high esteem.

Typical of these modern medical departments is one just completed at the Biddeford, Maine, mill of the Pepperell Manufacturing Company, whose main offices are in Boston. This widely-known textile manufacturer is running today at what might reasonably be called breakneck speed, producing its regular lines of sheets; herringbone twills now being used by the Government for fatigue uniforms; shirtings for the Navy, twills for shirts, pants, and hats for Army cooks; shoe linings for Army shoes; and other lines. The plan is to do everything reasonable in the company's power to keep its employees well, to guard their health, and treat emergencies when they arise.

New employees will be subjected to a careful examination, results of which are entered on a physical history card to be maintained on file in the clinic during employment. When a new applicant is accepted, the medical examination includes a check of weight, heart and blood pressure tests, eye tests, and other tests in a private examination room.

Many business men think that only the largest companies can afford medical departments, clinics, or whatever term you choose to call them. While Pepperell itself is a big company, with mills at Biddeford, Maine; Lindale, Georgia; Opelika, Alabama; Lewiston, Maine; and Fall River, Massachusetts, there are only 2,400 employees at Biddeford where the clinic here illustrated is situated. Many other clinics are operated by companies with fewer employees—some with less than 1,000 regular employees. In one company where there is an excellent medical department, absenteeism is down to almost the irreducible minimum, with an attendance record of 98.38, 98.57, and 98.59 per cent for three recent years.

Before employees can start to work, a carefully recorded physical history is begun preparatory to the examinations

Because weight is an important yardstick of good health, first step is to record new employee's weight, height, etc.

Instant treatment of the inevitable slight cuts, bruises, and other mishaps prevents development of serious cases

One end of workroom, showing well designed equipment built especially for this type of modern industrial clinic

Can We Pull Up the Slack In Selling?

BY EUGENE WHITMORE

Will selling ever recover from the licking it is now taking? There are plenty of powerful people in this country who call it a waste and who say we will never go back to old methods of selling and distribution. And they may be right unless we weed out selling's waste

A FEW weeks before Pearl Harbor and the resulting tight freezing order on certain types of office equipment, a sale for three office machines was completed which had been pending for more than seven years. Here is the story.

Eighteen years ago one company bought three accounting machines. They have been in daily use, giving yeoman service ever since. About seven years ago a salesman for the company which originally sold them began soliciting an order for new equipment. In the intervening years several important improvements have been incorporated in the machines.

From 1935 until 1941 we estimate that at least thirty calls were made by the three salesmen operating in the territory in an intensive effort directed toward trading out the three obsolete machines.

Is there anything wrong with this? No, except that it is expensive and probably unnecessary. Why do we say, "probably unnecessary"? Simply because about twenty-six or twenty-seven of the calls were just routine calls in which no really strong effort was made to show the prospect that the machines were costing him money every day. On the twenty-seventh call a new salesman came on the job. He knew from the serial numbers and the condition of the machines that the prospect had long since gotten his money's worth out of the three machines. But the prospect did not figure it that way. The machines were still working. So far as he knew they were working satisfactorily. After all he was the treasurer of the company and did not spend his time watching three office machines. The operators were not complaining. It would cost a lot of money to replace the machines. Why spend the money before it was absolutely necessary?

"When the machines break down and we can't have them repaired anymore, we'll talk to you about buying new ones," said the prospect, intending that statement, plus a gentle wave of his hand toward the door, as a dismissal of the salesman and the subject. But the salesman was one of these fellows you can't dismiss with a wave of the hand.

"Now just forget for a minute that I ever said anything about selling you new machines. I *think* those old machines are costing you money. But I can't *prove* it right now, and I do not expect you to buy until I can prove it. If they are costing you as much as I think they are, you want to know about it. Now give me permission to make a study of the operations in the department where those machines are working. If I cannot show you where you are losing money by keeping them—I mean prove to you in black and white—I will not call on you again for two years."

The prospect told the salesman to go ahead. A few days later he appeared at the office and spent the entire day there. He consulted the operators, talked with everyone in the department. He watched the flow of work in and out of the department and made a careful estimate of the work handled during the day.

A day or two later he called with a written proposal, which included an estimate of the cost of operating the department with three machines. His proposal pointed out that with new machines only two would be needed, and that a third or "stand by" should be purchased as a precaution, but put to work on another operation entirely. This new operation was being handled improperly and clumsily, because of the lack of modern equipment.

When the prospect read the proposal, with a direct statement of estimated savings, he said, "Let me have a day or two to check your estimates. If you are right, we owe you an order for three machines."

In about ten days (prospects never check up things like this as quickly as promised), the salesman had his order for three machines.

Now the whole point of this story is that the prospect bought just as quickly as he was given facts which made sense to him. The twenty-six previous calls might as well not have been made. The last four calls which the new salesman made were the only calls which were really worth while.

We can talk about calls—the

twenty-six calls made over a period of six years—as being worth while "just to keep in touch with the prospect," to "service the prospect," or to "keep the prospect happy" until the cows come home, and we still have little justification for such aimless selling. Perhaps this is the kind of selling which will have to go after the war. I told this story to one sales manager and asked him if he thought any of his salesmen were doing any such selling comparable to the twenty-six first calls made on this prospect.

"About 30 per cent of all our sales effort is exactly that and nothing else. We should not even dignify it by calling it selling. It is just visiting, dawdling, boondoggling, or thumbtwiddling. I've been guilty of plenty of it myself. And I don't know how to stop it. You can't expect salesmen to work under full steam day in and day out. I suppose it is just the inevitable 'slack' that we can't stretch out of selling, no matter how hard we try."

What sales managers must ask themselves, it seems to this writer, is: "Can a business stand 30 per cent 'slack' in sales effort?" If we don't ask ourselves that question, there are plenty of others who will ask it for us. As of today, with a shortage of manpower, of transportation facilities, with most plants swollen with undeliverable orders, the slack in selling may not be apparent, may not even exist, in many lines. But these present conditions will not last forever. The sales manager who begins now to devise ways and means to take up the slack in selling, if any exists in his organization, is the sales manager whose company will be the first to report dividends in the post-war readjustment period.

For some time now I have been asking purchasing agents how much of their time is taken up by salesmen who are making routine calls. Routine calls, I explained to these purchasing agents, mean the kind of calls when a salesman comes in for a visit, stops for a chat, or

(Atwell Photo)

How Much Can You Pay For Sales?

Seems like a silly question to ask now, what with sales rolling in faster than the factory can produce and most customers clamoring for more goods. But this will not last forever, and today many smart buyers are determined to answer the question for every seller who gets their business.

The smart buyers of tomorrow simply are not going to pay high selling costs. But that's not all. There are plenty of powerful and influential people in America today who think that our present sales and distribution machinery is obsolete and doomed. With the new competition rising from the giant plants we are building today, there will be little room left for the outfit with high sales costs. This is the second of a series of articles written to put the spotlight on some phases of selling which could stand improvement. The next will be published in an early issue of "American Business."

says, "Just came in to see if there's anything doing in my line today." There are all varieties of this type of call, and all degrees of sales effort are expended on them. But the purchasing agents estimate even today, with many salesmen not calling at all, that anywhere from 10 to 30 per cent of all salesmen's calls are no more than routine calls, with no special sales effort expended, no definite proposal, no pertinent information to leave. Some purchasing agents estimate this type of call to amount to as high as 60 per cent of all calls made on them by salesmen.

"About a third of the salesmen who call on me are just on what I call 'fishing expeditions,'" said one purchasing agent. "These salesmen come in to:

(1) Ask if we use anything in their line.
(2) Learn if we are satisfied with present sources.
(3) Ask for a 'share of our business.'
(4) Make vague claims about 'saving money.'
(5) Beg for just a 'trial order.'
(6) 'See what's doing these days.'

"Of course, I have to be courteous to all of them, but they do take up a lot of time which I could use more productively. Time after time I wonder what a salesman really came to see me for. I think as many as 20 per cent of all salesmen who call on me never come back again. The percentage of 'one-timers' may be even higher for all I know, but that's my guess.

"I think it is true that many purchasing agents are mildly dissatisfied with present sources of supply. But we continue buying from them only for one reason: No one else offers much evidence that they would be better. In half an hour I could list twenty suppliers whose salesmen I do not trust completely, whose deliveries are almost never as promised, and whose general methods of doing business are none too good. But we make no change because we are unaware of better sources, despite the fact that their competitors constantly solicit our business. But the solicitation is done in such a haphazard, lack-lustre manner that we are not moved to experiment for fear of slipping out of the frying pan into the fire."

Is this a severe indictment of salesmanship as it is practiced today? Is it an unfair characterization of present-day salesmanship? In talking with all these buyers we cautioned them to remember that immediate conditions are wholly abnormal; we asked them to think back a year or more when conditions were not so upset. We are afraid that the purchasing agents are all too right. What they say is too true to leave us comfortable about the future of salesmanship.

After the war there is going to be, many business men think, more negotiation, more contractual relationships, and less "selling" as we know selling today. Typical of this idea is a recent case which came to my attention. A big lithographer was tipped off to a piece of business which was to be placed. Said the friend who brought the tip, "Sharpen your pencil and get over there and land this job."

"But that's not our way of doing business," patiently explained the lithographer.

"We are not looking for orders. We are looking for customers—steady customers who buy over and over again, who know what we can do, who have confidence in us, and who will let us work with them."

"But, it seems to me you have forgotten one thing," objected the friend. "You have to get orders before you have steady customers. What's to keep you from making a customer out of this prospect I am giving you?"

"Nothing at all, except his way of buying. If he shops around for a lot of bids on every order, we can never hope to obtain but a small share of his business. With such customers our selling costs are so high that we either make no profit on the business or we have to charge so much that we can't hold much of his business," answered the lithographer.

"Seems like a pretty arbitrary and high and mighty way of doing business," said the friend.

"It's nothing of the sort," answered the lithographer. "It's just good business, and it is our way of keeping costs within reason. If some customers really knew how much of the prices they pay went for selling costs, they'd reform their buying habits. Where we can work with a good customer, who buys at frequent intervals in quantities we can run economically on our presses, who does not make impossible demands for preliminary sketches, free art work, and other luxury services, we can keep our selling costs as low as 6 and 7 per cent. As soon as we enter this hectic frantic bidding for every order received, paying a force of salesmen to stay out on the streets hunting for a chance to bid on every job that comes up in town, our selling costs go up to 15, 20, and 25 per cent."

The better class of customers in any line of business today are not paying for the type of selling that costs too much. Everywhere smart buyers are studying costs and placing orders on such a basis that unreasonably high selling costs are ruled out. This means that the seller with abnormally high sales costs must look to the small customers, the slow pay customers, the chiselers, the generally unsatisfactory customers for business.

It is a puzzling circle—you can't sell the smart buyers if your costs are too high, and your costs will be too high if you do not sell the smart buyers. So the only answer which seems sensible is to prepare salesmen to sell at costs which are reasonable. But it is more than a sales training job—it is a job of market survey, of selective selling, of customer analysis. And that's a story to come in future issues.

One girl handles the pneumatic riveter; the other bucks the rivets at the plane plant of Glenn L. Martin Company

Operating sanding machines, putting finishing touches on plane parts. Women operate dozens of these machines

New Jobs for Women—II

BY F. C. MINAKER

ALTHOUGH the experience of the aircraft plants on the West Coast and that of the government arsenals has proved the value of women workers in increasing production, some plants are slow to add them to their forces. Selecting, hiring, and training women workers looks like a tremendous problem to the employment man, but by keeping in mind the fact that hiring a new woman worker is just hiring a *new worker*, he has the solution to his problem. He will find that there are few employee problems which apply to women only. New women workers have to be carefully selected—but so do men. New women workers need training—so do men. Women without factory experience are entering a new environment, but so are the men who go into factory work today from farms, offices, and disbanded sales forces.

Prejudice against women in highly skilled jobs sometimes plays a part in preventing the most complete employment of women, but it stems from lack of knowledge and misconception of women's abilities. The old idea that women have no mechanical ability, interest, or aptitude has long since been disproved. But this prejudice still persists and is responsible for some of the policies which frequently prevent the upgrading of women in industry. The statement that women have no mechanical ability is, of course, incorrect. A more precise statement would be to say that they have no mechanical *familiarity*. Once familiar with mechanical details and equipment, as men are, women's ability and aptitude soon become apparent.

Prejudice on the part of foremen and other workers against the infiltration of women workers sometimes presents itself. It is comparatively rare, but where it does exist it is the job of management to get rid of it. Once a few women have been employed in a plant, the other employees become accustomed to seeing them working at machines along with men and this prejudice is rapidly broken down. Then the way is paved for the hiring of larger numbers of women.

The airplane plants have failed to encounter prejudice to any extent for most of these plants are new—new methods, lighter tools, new training practices. From the start the picture has been one of men and women working side by side, doing pretty much the same type of work at the same rates of pay. The survey of California's aircraft plants last year found women and men working together throughout all departments with the greatest of harmony.

The employment of a woman personnel official on a firm's administrative staff, while helpful, is not essential. As a matter of fact, there is nothing in the selecting, hiring, and training of women workers which cannot be handled by the existing personnel staff accustomed to hiring men. The relation of new women employees to the personnel department is the same as that of new men, and while women are useful in personnel work in plants, it is not necessarily because the factory employs women workers.

The part women play as supervisors is an important one. As

first-line supervisors they can sometimes handle routine departmental problems concerning women more easily than men. Women can also train other women, if they themselves have been properly trained and coached for this work. It should be emphasized here that the opening of even minor supervisory positions to women provides a promotion incentive for women. It is important, however, for women supervisors to have corresponding authority with men in similar positions, otherwise employees may be inclined to ignore the women supervisors and take their problems to the man who they feel is "the boss."

Working conditions are covered pretty carefully by existing state laws. There are, for instance, definite state laws regarding the hours of work for women, wage payments, wage assignments, work of minors, and facilities for employees covering health, safety, etc. State laws also restrict the type of occupation held suitable for women. Recently, efforts have been made to loosen up some of these laws for "the duration" in order to get into all-out production. Where the state law prohibits overtime for women, and limits employment to the eight-hour day (in Illinois, for instance), some adjustment may now be made to allow for overtime in war industries. States which have a ten-hour law on the books for women will not, of course, be in the position of having to soften the law. Many states do not permit night work for women in factories and such states are somewhat unwilling to lower this bar even for the war industries. Some of the old blue laws hamper all-out production not only of women workers but men as well. Rhode Island's strict law against Sunday work is a case in point.

In cases where management finds the state laws hampering the extensive use of women in war industries, application should be made to the state Industrial Commission or the state Secretary of Labor for an exemption or modification of such laws for "the duration." The following table shows the variation in state laws regarding the employment of women:

	States Having Laws	
	1918	1940
8-hour day, 48-hour week, or less (some occupations)	3	19
8-hour day (some manufacturing occupations)	6	15
Minimum wage laws	12	26
Regulation of industrial homework	13	18

Adequate information on these laws may be obtained from the Women's Bureau, Washington, D. C., or from the various state Industrial Commissions.

The forty-eight-hour week is the work week recommended by most authorities for women. The Women's Bureau recommends it as being the most productive and the least fatiguing for women; safety engineers recommend it as most conducive to safety standards. A longer work week has generally been found to decrease production over a period of time. The British experience in attempting to apply a sixty-hour work week resulted in a reduced production per man hour. Prolonged periods of such work weeks defeated the purpose of speeding up production because piled-up fatigue increased accidents and absenteeism. It has also been found that a one-day-rest-in-seven promotes production of work. Generally speaking the following standards of employment are recommended for women, although they apply equally well to men:

Half-hour meal period with opportunity for a hot meal. Best possible lighting and ventilation arrangements. Prevention of constant standing or sitting by providing adjustable seats for workers. Safe work clothing, including caps, goggles, gloves, etc. Carefully guarded machines and all other safety precautions. Adequate first-aid equipment and medical department. Adequate washing, drinking, and toilet facilities. Lunch rooms, dressing rooms, and rest rooms.

Experience with workers has indicated that *(Continued on page 37)*

This girl operating an automatic riveter is doing work once thought to belong to men at the Martin bomber plant

Although previously considered men's work there is nothing about this riveting job which a woman cannot perform

(The Studebaker Corporation Photo)

When You Think You Need More Office Help

IN MANY cities it is no longer easy to hire office help. That skinny boy who used to fill out forms over there in the corner is learning about the business end of a Garand rifle now; the giggly blonde who pounded a typewriter in the first aisle has gone to Washington—and so on—and on.

Meanwhile office costs go up. Work accumulates. Lights burn overtime. Yet much of it is unnecessary. Recently one company found its clerks using fourteen different printed forms to write up an order, have it manufactured, shipped, and billed. Now one form, quickly prepared, completes the job—even to the shipping tags and the piecework payroll tickets.

Did you ever stop to figure how much of your total typing time is spent in fooling with carbon paper? It is really shocking when you figure it up. According to one forms manufacturer a typist writing letters or forms with an average of five lines of typing, making originals and eleven copies, spends 78 per cent of the time stuffing, jogging, inserting, realigning, adjusting, and unshuffling carbons!

But you object that you don't make eleven copies of anything written in your office. All right, so what? If you require only one copy and typists average fifteen lines of typing per form or letter, there is still 17 per cent of total time spent in juggling carbons. The figures vary according to the number of copies and the lines written. With four copies and an average of ten lines, more than a third of the time is spent juggling carbon paper. This seems to be too much of a cost burden in these hectic times.

In the past ten years there has been an amazing development in so-called "snapout," "easy-out," multi-fold, fan-fold, one-time carbon, spot carbon, and other types of continuous or snap-set forms. The variety is amazing—the applications endless. A survey of the average office will show hours upon hours spent in doing things the old way, when it would be easy to increase production of machines and workers from 10 to 40 per cent with properly designed forms. That's the cheapest answer to the "help wanted" problem today.—*E. W.*

When You Need More Office Room

United Autographic Register finds that modern desks and tables, properly arranged, eliminate the need for an addition to the office. Uses smaller desks and finds room for more than 25 additional employees in space which seemed overcrowded before new arrangement

WITH sales constantly growing, United Autographic Register Company needed more office room. Although the company's office was completed in 1930 and is modern, well lighted, acoustically treated, it was not large enough to accommodate all the people, desks, tables, machines, and equipment which had been crowded into it.

The main office staff worked in a room 116 by 78 feet, with an ell measuring 32 by 20 feet. Across the reception room at the south end of the office there is another room where the advertising, educational, and sales planning departments were housed. Downstairs, in the factory building in the center of the pressroom was the planning department. Need for new presses dictated a move for the planning department, but there was no place to move it. First studies of the problem seemed to indicate an addition to the office building.

While the puzzle was still being studied, someone suggested that smaller desks, more modern equipment, and perhaps more careful arrangement of the offices would permit the removal of the advertising, educational, and sales planning departments to the general office. Then the planning department could be transferred to the space thus vacated.

United's experience shows that desks are too high and too big. With smaller, lower desks employees are more comfortable and there is room for more people

Here is a group of girls at work on the battery of Autotypists which are used both for writing collection letters and various kinds of sales promotion work

Here was an idea worth investigating. Although it looked like a forlorn hope at first, Fred P. Dauber, the office manager, tackled the job of putting twenty-five extra desks and people, one Multilith machine, two Mimeographs, two commercial artists with drawing boards, and three Autotypists into the general offices. Remember—these people and their equipment were to be added to an office that

already seemed to be well filled.

This was found possible by the use of the small-sized Convertible desks (see AMERICAN BUSINESS pages 30-31, November 1940) which are 58½ by 26¾ inches instead of the usual 60 by 32 inches, so commonly used for clerical desks. There were 96 of these small desks installed. There were also 15 desks slightly larger, 58½ by 34½, for executives and department managers, 9 stationary-bed typewriter desks, and 12 tables.

In the Convertible desk the body or pedestals remain the same, and only the tops are changed. Thus it is possible to make many changes in an office without moving a desk. Typewriters are used on a detachable shelf which fits into the pedestals in place of two drawers and may be changed from left to right. In the United office, girls on one side of the office use the typewriter shelves on the left, on the other side of the office on the right, so that the light from windows is always coming from the proper direction. If it is found that someone needs a larger desk, the removal of a few screws makes it possible to change tops.

There are some desks and some plain tables in the picture above. Where a file clerk did not need supplies storage space, a table was used instead of a desk

With each desk or table especially selected for the type of work to be done, it was possible to step up efficiency in almost every department at United

Convertible desks are 2 inches lower than standard. As every reader knows, most office desks are 30 to 31 inches high, with the average height 30½ inches. This is too high for comfort and greatest efficiency. But it was never possible to build a lower desk because there was not enough room for knees in the knee well so long as we insisted on the shallow center "catch-all" drawer. There are no center drawers in the Convertible desks, so it is possible to lower the desk to the more comfortable and efficient height of 28½ inches. Readers who remember the original announcement of this desk in AMERICAN BUSINESS in November 1940 recall that it was developed by W. E. Tarr, office manager of Studebaker at South Bend, Indiana. There was some doubt that the height was correct and some ticklers for things, as they have always been, objected. But since then other desk makers have announced lower desks, and it seems the lower height will become standard in the future. Mr. Dauber, of United Autographic, reports universal satisfaction with the lower height in United's offices and states that the smaller area is wholly satisfactory as well. No complaints have been heard anywhere in the office from people using the smaller desks. While desk sizes vary, the usual size is about 60 by 32 inches for clerical workers, although many clerical employees work at larger desks. It is thought that there is an average floor space saving of about 500 square inches in each case where the smaller Convertible desks are used.

Another saving was the elimination of counter files in the filing department. A long counter, with three-high filing drawers underneath, was eliminated and five-high files substituted. This saved considerable space.

In arrangement care was taken to create a layout which enabled

Keeping right up-to-date on salesmen's accounts and commission statements is possible with this modern Underwood Elliott Fisher electric accounting machine

Close-up of the ledger posting department. The trays are kept in order on tables which were selected to match the Convertible desks in style and design

In this central transcribing department, dropped, fixed bed typewriter desks are used instead of the pedestal typewriter shelf desks, as shown on page 30

work to flow in straight lines without backtracking or crisscrossing. For example, the mailing section is adjacent to the customers' ledgers and the credit department, first departments to deal with the day's orders. Throughout the office there is this same thought for related operations being as convenient to each other as possible.

The central typing and transcribing unit, the automatic typewriters, the Multilithing and Mimeographing machines are all in the 32 by 20 foot ell mentioned earlier in this story. So are the Teletype machines. In this department company publications are printed and gathered and most of the promotion material prepared. United uses automatic typewriters for many credit department follow-up letters on slow-pay accounts—one machine for this and three for promotion activities.

United keeps a close check on customers. Every customer is represented by a card in an elaborate visible index system arranged by territories. At regular intervals each tray of record cards goes to the photostat machine where a print is made. The tabs on the visible margins show the status of the customer — when he last bought, when he was last visited by a salesman, product purchased, quantity and other pertinent information. These facts enable the sales executive in the field to see almost at a glance the exact status of every customer represented by a card in the tray.

Being a manufacturer of continuous forms, it is to be expected that United would not be content to let typists waste much time stuffing and unshuffling carbons. In the transcribing department each typewriter is equipped with a Speed-O-Form attachment, a device which handles letterheads, copies, and carbons with little more than the press of a lever. From a folded continuous form back of the typewriter Speed-O-Form feeds letterheads, copies, and carbons into the typewriter platen. When the letter is finished the letter and

FOOD

MORALE

PLANES

WASTE-PAPER

SHIPS

GUNS

STEEL

SPEED ★

OIL

TANKS

PROPAGANDA

WHAT HAVE YOU

WILL WIN THE WAR!

★ SLOGANS to the contrary, of course, no one thing will win a victory over totalityranny.

But in the list above, we naturally concentrate on *speed.* Because the Comptometer adding-calculating machines we make are famous for that very timely quality.

And today, when all of us are racing against time on the production front, Comptometer machines and methods are key weapons in Management's arsenal . . . *particularly on payrolls and costs.*

Because the whole figure-work picture has been drastically revised by war, with many concerns going on multiple shifts of clerical help, your local Comptometer Co. representative is prepared to suggest ways in which your present Comptometer equipment can be better adapted to meet your new problems.

Telephone him . . . or write to Felt & Tarrant Mfg. Co., 1724 N. Paulina St., Chicago, Ill.

This is where we'd ordinarily put a picture of the Model M Comptometer. Because these extraordinary times emphasize the importance of COMPTOMETER METHODS *so strongly, we've omitted the machine in an effort to call your attention to that emphasis!*

COMPTOMETER

REG. U. S. PAT. OFF.

ADDING-CALCULATING MACHINES AND METHODS

Here is a section of the credit department, with the ledger posting department in the background. The desks are equipped with stands for typewriters which fit into desk pedestals, offering a stable support which can be used either at right or left

Two Underwood Elliott Fisher flat bed machines used in the billing department. Note continuous form device

No time is lost juggling carbons when writing purchase orders, as a similar continuous form is used here, too

copies are removed with one motion, while the carbons are returned to position between original and copies, ready to start the following letter.

This equipment permits the typists to continue typing, instead of losing from 15 to 50 per cent of their time stuffing, jogging, aligning, and unshuffling letterheads, carbon paper, and copies. In this department the stationary-bed typewriter desks are used, in place of the pedestal typewriter shelves in other departments. This is because work is speeded with the typewriter in the center of the desk, the Ediphone at the right, and necessary papers and supplies at the left.

Like most other offices United is losing young men to the armed services and experiencing the same difficulties confronting most others in finding trained help to replace the men. Sales are larger than ever before and there's more paper work to be done, especially in cases where products go to the Government or government contractors. Yet by this improved arrangement, by use of tested machines, equipment to speed work and increase output, United's paper work is right up-to-date at all times. Where it would be under present conditions no one knows, were it not for the modern equipment being used.

Finding Jobs for Workers When War Stops Business

LATE in March officials of the United States Maritime Commission walked into the offices of the Colonial Line, Pier 11, North River, New York, and said, in effect, "We are taking your three vessels for the War Transport Board. Here is your receipt."

It was almost as simple as that, and at that moment the Colonial Line, long famous for its New York, Providence, Boston freight and passenger services, was out of business for the duration. The company's first thought was, "What about our employees, some of whom have been with us as long as thirty years and more?"

Soon after the transfer of the vessels to the War Shipping Board, Frank M. Dunbaugh, Jr., vice president of the line, inserted a double-column advertisement in both the new York *Times* and the New York *Herald Tribune* which read, in part:

> We want to place these Experts. . . .
> Our ships taken for war use . . . Picked men and women who doubled our traffic now ready to work for you . . . Passenger and freight traffic men, accountants, stenographers, telephone operators, purchasing agents, rate clerks . . . other trained personnel.

The advertisement solicited confidential inquiries from employers who were in need of such trained help. No sooner had the papers hit the streets than Colonial Line's telephone began ringing. The 100 or more people (only office people were included) began receiving names of prospective employers to visit. Never before in the company's history were so many calls received. In three days almost all of the employees were placed. One of the largest banks in New York sent over a personnel officer to study the employment records and interview Colonial employees. A famed aircraft instrument company took several employees and even asked to interview some of the nonoffice workers who were at liberty. Employees outside the office were union members and will be placed in new positions by the unions of which they are members.

Officials of companies with which Colonial has done business for many years were among the first to offer positions to some of Colonial's help. Only difficulty encountered was with a few of the elderly employees who were not employed as this report is being written.

When a reporter for AMERICAN BUSINESS called the offices early in April, Mr. Dunbaugh was saying goodbye to a colored man who had been employed by the lines as steward for more than thirty years and who had been with Mr. Dunbaugh's father for ten years prior to that.

The company's effort to assist its former employees has been most gratifying, it was reported, and the response of other business organizations most encouraging. While it may be true that few other businesses could be so completely transferred to war effort, it is possible that other companies will have to face similar problems in the future. Colonial's experience shows that there is no need to throw employees out of work and leave them to their own devices in obtaining new employment.

How Marshall Field and Company, Chicago retailer and manufacturer, gets across the need for conservation of supplies in its house magazine, "The Field Glass"

Teaching Men to Use the Product

Hobart Brothers, welding equipment maker, finds it is profitable to conduct well equipped school to teach modern shop practice methods. Plan creates supply of trained labor and builds good-will among customers

MANY manufacturers of industrial, office, and production equipment have found it necessary to train workers to operate the machines they make and sell. There is nothing new about schools of this nature. Felt and Tarrant Manufacturing Company, widely-known manufacturer of calculators, conducts such schools for calculating machine operators. The several manufacturers of typesetting machines have long conducted schools for operators and the typewriter companies were pioneers in training typists, long before stenographers were trained in public schools.

No company manufacturing a machine can get very far unless there are men or women available to operate the machines after they have been installed. Today, more than ever, there are all kinds of shortages of skilled labor.

In the welding field, which has grown by leaps and bounds, there is a woeful shortage of trained welders. In an effort to meet the shortage and supply skilled and trained men, Hobart Brothers, well-known Troy, Ohio, manufacturer of welding equipment, has recently opened one of the finest vocational trade schools anywhere.

With facilities for training eighty students in arc welding, the school already has a full registry for its first few weeks of operation. It is a non-profit organization established for the purpose of bettering the welding profession by sending trained and qualified men into the field.

The neoteric structure of the school's building is an excellent example of the fabrication methods taught in the school—being built entirely of arc welded steel and glass. Perhaps the most interesting architectural feature of the building is the circular entrance tower. Inside the tower is a visitor's vestibule and lounge where students may visit with their parents or friends. The second floor of the tower is reached by a circular arc welded steel staircase. Glass brick has been utilized in the entryway for lighting as well as for ornamental value.

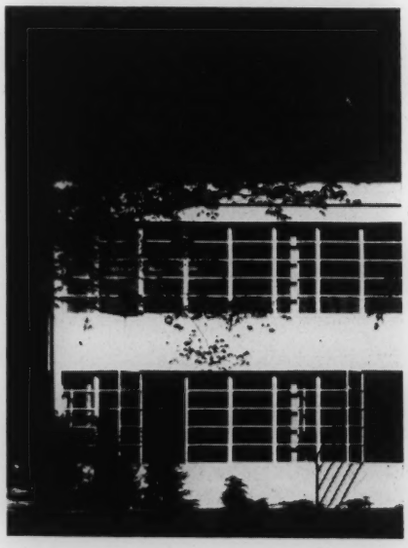
The main course of study offered consists of 160 hours of training which thoroughly covers the metallic arc welding of steel with both plain and coated electrodes. For students who have advanced through the main course, or for experienced steel welders, additional special courses by personal instruction are provided in welding non-ferrous metals or special alloys. Each student is given personal attention and is advanced as rapidly as his own work justifies. The progress of apt students is not retarded by slower learners. The length of time required by students to become adept varies, of course, with each individual student. However, the average period of training time is four weeks.

Each student has the private use of an individual welding booth equipped with welding bench and machine. An arc welded ventilation system separately connects each of the school's fifty welding booths, and ventilation may be regulated by each student in his booth according to his desires. Slide curtains provide eye protection from the arc in the aisles of the school. A work chart is kept by each student in his booth showing his progress and also the size metal, electrode, and welding heat used for every lesson. Present accessory equipment includes grinders, power hacksaws, drill presses, and a metal brake.

Robert Bercaw, chief instructor, is an expert welder with twenty-three years of experience in the field. Mr. Bercaw stresses practicality in his lessons and exercises. The student who wishes to perfect himself in the theories and technical phases of arc welding, however, has the privilege of attending all lectures and classes conducted at the Hobart Brothers Company for factory personnel. Students may also observe many practical applications of arc welding in the Hobart factory where this method of joining metals is skillfully used in the manufacture of arc welding machines, motor generators, and other products.

The school will be eventually developed to provide complete

The school itself is a demonstration



training in machine shop practice and other mechanical trades.

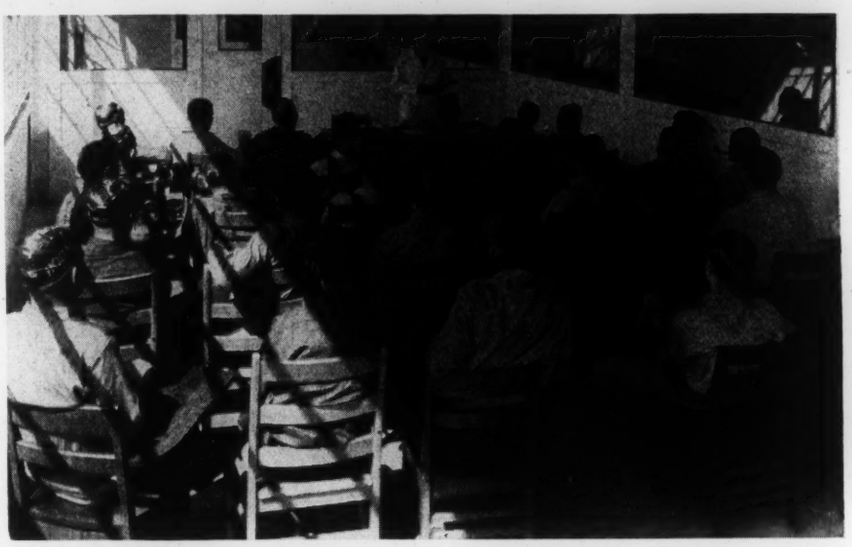
A recent sample poll of former students showed that practically every Hobart student procures welding employment immediately following completion of the training course—and there is always a waiting list for specially equipped students.

Friendly relationships exist between students, instructors, and the Hobart Brothers Company long after students have finished their training. "Stay acquainted" letters are sent to all former students containing news items about students, the school, and the welding trade.

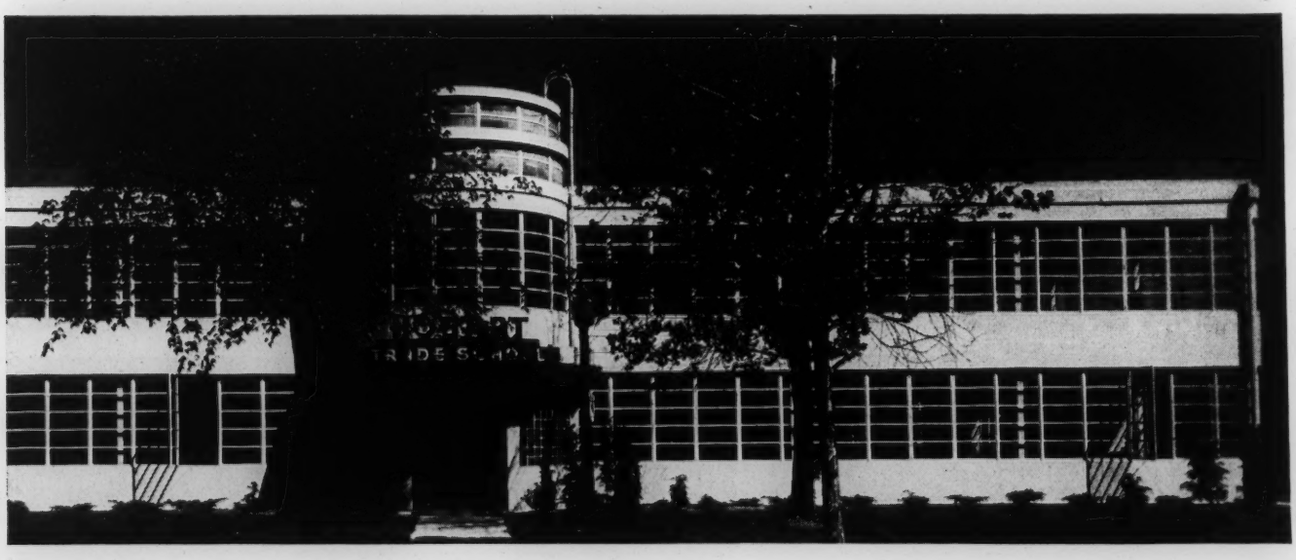
Visitors are welcome at the trade school. Hand shields and guides are provided on tours. Located on the Dixie Highway (US 25), the school receives hundreds of visitors every year.

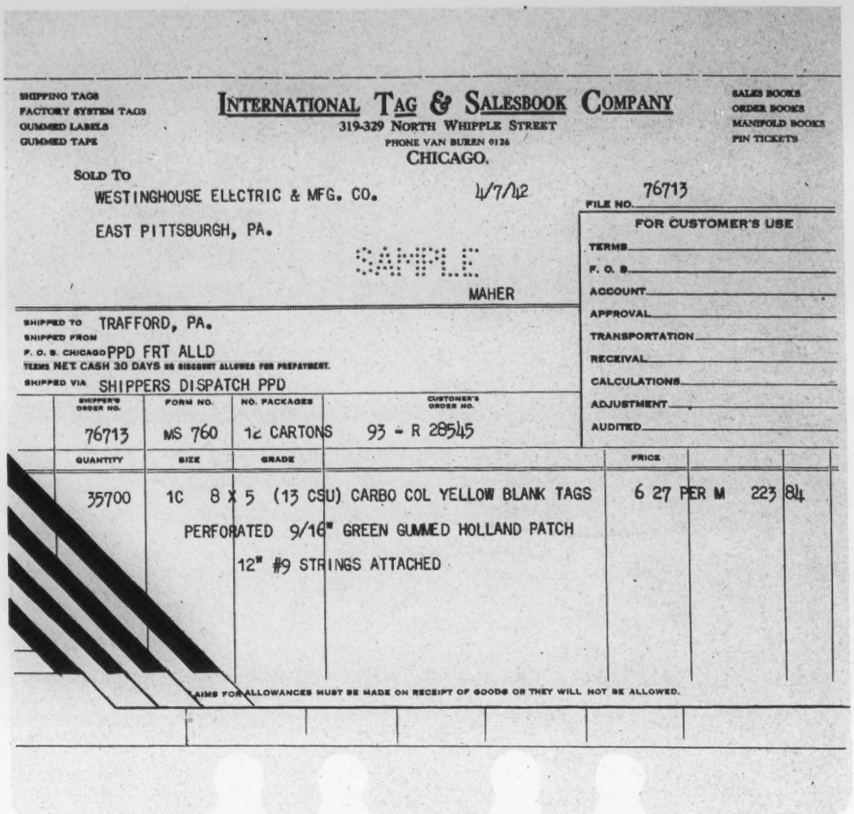
From a management standpoint it is highly profitable for any manufacturer to be able to claim that there is always a supply of factory trained labor to operate the machines he sells. It is possible that every student from a school of this nature becomes somewhat of a voluntary salesman for the company's equipment. If this is true the manufacturer, who operates a school of this kind, is building sales and good-will for a long time into the future.

Each student is assigned a welding booth, permitted to use most modern equipment during his stay at Troy. Other trades will soon be taught in the school



Ample facilities are provided for lectures and other study activities as well as actual shop practice. All students so far have found positions immediately of the welding methods taught. It is built of arc welded steel and glass. A circular, welded steel staircase is a feature





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4/7/42

FILE NO. 76713

SAMPLE

MAHER

FOR CUSTOMER'S USE
TERMS
F. O. B.
ACCOUNT
APPROVAL
TRANSPORTATION
RECEIVAL
CALCULATIONS
ADJUSTMENT
AUDITED

SHIPPED TO TRAFFORD, PA.
SHIPPED FROM
F. O. B. CHICAGO PPD FRT ALLD
TERMS NET CASH 30 DAYS NO DISCOUNT ALLOWED FOR PREPAYMENT.
SHIPPED VIA SHIPPERS DISPATCH PPD

SHIPPER'S ORDER NO.	FORM NO.	NO. PACKAGES	CUSTOMER'S ORDER NO.
76713	MS 760	1c CARTONS	93 - R 28545

QUANTITY	SIZE	GRADE	PRICE	
35700	1C	8 X 5 (13 CSU) CARBO COL YELLOW BLANK TAGS PERFORATED 9/16" GREEN GUMMED HOLLAND PATCH 12" #9 STRINGS ATTACHED	6 27 PER M	223 84

CLAIMS FOR ALLOWANCES MUST BE MADE ON RECEIPT OF GOODS OR THEY WILL NOT BE ALLOWED.

A snap out form, with one-time carbon, is used for invoices, with the final copy serving as the ledger sheet. It is punched for filing in binders to prevent loss

THIS PLAN CUTS LEDGER POSTING COSTS

As office employees are called to service and paper work piles up, this plan may prove to be one solution to the need for cutting operations in the office to conserve time, speed work, cut costs, and reduce errors

WITH business increasing more than 50 per cent, the International Tag and Salesbook Company, Chicago tag maker and business form producer, has been able to handle this increased volume of business with no increase in clerical help. This is partially due to time-saving innovations in accounting, one of which is an accounts receivable system wherein the ledger sheet is but a carbon copy of the invoice to the customer.

Before the adoption of the present system, the customer's ledger cards were posted by a posting machine which gave automatic balances. Whenever a new customer was sold, a ledger sheet had to be headed, even though more than one debit and credit to the account might never be necessary. Also, under this system, the old balance of each account had to be brought forward for every posting, and, regardless of various controls involved, it was impossible to prevent errors in this operation. Result: Balance shown on ledger card was not always correct. The amount of work involved whenever the accounts were not in balance with the controls was considerable and had always been a bottleneck at the end of the month.

The new system evolves around a billing system in which one-time carbon sets are used. The number of copies in the set usually depends upon the number of invoices which the customer may require. The last copy acts as the "ledger sheet," and becomes the accounts receivable record.

When the billing department has completed the invoices for the day, an adding machine tape is run for the total and all ledger sheet copies are turned over to the accounts receivable department. The sheets are then totaled and, if in agreement with the billing department tape, are ready to be sorted and filed. To insure against any loose handling, the ledger sheets are notched so as to fit into binders. These binders are broken down into several controls and classifications of accounts. That is all there is to the complete accounts receivable routine. There is no necessity for posting to a single ledger card.

The routine of handling credits is very similar to that of debits. The remittances received are matched up with the ledger sheets, which are then removed from the binders. A total is run off and, if in agreement with the total of the remittances, the sheets are ready to be put through the bookkeeping machine, which records the date of payment and also accumulates the paid amounts. This total should be the same as the two previous totals run off. The sheets are then temporarily filed until the end of the month, at which time a total is taken of all unpaid invoices. After checking to see if this total agrees with the controls, the paid invoices are filed with those previously paid.

Booklet Helps Find War Work

AN ILLUSTRATED "sales" brochure to acquaint government procurement officers, prime contractors, and procurement engineers with the company's plant and production facilities has proved successful for the Benwood Linze Company, St. Louis manufacturer of electrical rectifiers. While the company's sales of this equipment were at record high levels, it was necessary to obtain government war work to keep the plant busy because of material restrictions on any but material for war production.

An 8½ by 11 inch, plastic-bound, twenty-two-page booklet, printed in two colors, did the job of putting the company into war work. It was mailed to a large list of names of men in a position to negotiate contracts. Cover of the booklet is a picture of the entrance to the plant. Inside are pictures and lists of the company's executive personnel, with facts about the experience of twenty-one officers and executives. This list is followed by twenty pictures of office and plant interiors, and a double-page organization chart showing how authority is divided in the company and the responsibility of different officers and executives for every phase of the company's operations.

There are two pages of illustrations of the products, and a list of all electrical devices and equipment where the company's products and experience can be used. This brochure was used in connection with the usual plant survey required by the Government in surveying and appraising plant facilities for war production. The booklet gives a better idea of the plant than the survey.

From bank statement
to Permanent Records

Profit by the eighty years' experience that gives PARSONS RECORD PAPERS distinctive appearance, ruggedness and durability that can't be matched. Made from cotton fibers, they have strength to withstand rough usage—then remain intact for ages. The surface is smooth to the pen, yet immune to erasures and thumbing. You pay no more for the extra quality of PARSONS RECORD PAPERS, so why not enjoy the benefits? Ask for sample book or test sheets.

Sample books of these grades can be obtained from your Printer, Lithographer, Parsons Merchant or direct from the mill.

PARSONS RECORD PAPERS... OLD HAMPDEN BOND · GOTHIC BOND
LACONIA BOND · SCOTCH LINEN LEDGER · PARSONS LINEN LEDGER
DEFENDUM LEDGER · MERCANTILE RECORD · PARSONS INDEX

Parsons BONDS LEDGERS INDEX

PAPER COMPANY · HOLYOKE · MASS.

See
WOODSTOCK
TYPEWRITERS

This Hullabaloo About Profits

(Continued from page 11)

manufacturing peacetime products.

Deprived of all right to continue making peacetime products these manufacturers cannot re-convert to peacetime products unless a fair profit on their contribution to winning the war is allowed. And it is important to remember that what is a fair profit to one company would send another company into bankruptcy. That's why it will be dangerous to set up a rigid, predetermined profit percentage to apply to every producer of war materials.

There is considerable clamor in America today to the effect that we are going to have a new economic set-up after the war. It may be more accurate to state that we will have a new economic "fall-down" if our leading industrial companies are financially wrecked to please the highly emotional and sentimental people who have suddenly decided that profits are wicked. If we bow to these people in the belief that profits are no longer patriotic, we must accept the fact that we have then abandoned our tried and proven economic principles, and that we must find something to replace profits as an incentive, as a seedbed for industrial growth, and as a foundation for our national prosperity.

It is a case where we confuse patriotism, loyalty to our leaders, and love of country with sound economic sense. If, in a gust of mistaken patriotism, we wipe out the ability of our industrial enterprises to survive, we may live to see the day when we will long for slightly less of this brand of patriotism and more realism in our thinking about the national welfare.

As has been proved time and again—in Holland, Norway, Belgium, at Dunkirk, in Greece, on our own blood-soaked Bataan peninsula—the highest degree of bravery and patriotism and willingness to serve avails all too little when facing more guns, more planes, more firepower. Profits are the sinews of a strong, prosperous, well employed country, just as surely as guns and planes and tanks are the sinews of war. We must be as realistic about one as the other.

Government By Alphabet

SO THAT you may recognize the various alphabetical agencies in the Government, here is a late list:

AAA—Agricultural Adjustment Administration.
BAE—Bureau of Agricultural Economics.
BEW—Board of Economic Warfare.
BLS—Bureau of Labor Statistics.
CAA—Civil Aeronautics Administration.
CAB—Civil Aeronautics Board.
CCC—Civilian Conservation Corps; also Commodity Credit Corporation.
COI—Coordinator of Information.
DCB—Defense Communications Board.
DHC—Defense Homes Corporation.
DPC—Defense Plant Corporation.
DSC—Defense Supplies Corporation.
EHFA—Electric Home and Farm Authority.
FBI—Federal Bureau of Investigation.
FCA—Farm Credit Administration.
FCC—Federal Communications Commission.
FCIC—Federal Crop Insurance Corporation.
FDA—Food and Drug Administration.
FDIC—Federal Deposit Insurance Corporation.
FHA—Federal Housing Administration.
FHLBB—Federal Home Loan Bank Board.
FLA—Federal Loan Agency.
FPC—Federal Power Commission.
FSA—Farm Security Administration, or Federal Security Agency.
FTC—Federal Trade Commission.
FWA—Federal Works Agency.
GAO—General Accounting Office.
GPO—Government Printing Office.
HOLC—Home Owners Loan Corporation.
ICC—Interstate Commerce Commission.
MRC—Metals Reserve Company.
NACA—National Advisory Committee for Aeronautics.
NDAC—National Defense Advisory Commission.
NDMB—National Defense Mediation Board.
NLRB—National Labor Relations Board.
NRPB—National Resources Planning Board.
NWLB—National War Labor Board.
NYA—National Youth Administration.
OADR—Office of Agricultural Defense Relations.
OCD—Office of Civilian Defense.
ODT—Office of Defense Transportation.
OEM—Office for Emergency Management.
OFF—Office of Facts and Figures.
OGR—Office of Government Reports.
OLLA—Office of Lease-Lend Administration.
OOC—Office of Censorship.
OPA—Office of Price Administration.
OPACS—Office of Price Administration and Civilian Supply.
OPM—Office of Production Management.
OSRD—Office of Scientific Research and Development.
PBA—Public Buildings Administration.
PRA—Public Roads Administration.
PWA—Public Works Administration.
REA—Rural Electrification Administration.
RFC—Reconstruction Finance Corporation.
RRB—Railroad Retirement Board.
RRC—Rubber Reserve Company.
SCS—Soil Conservation Service.
SEC—Securities and Exchange Commission.
SMA—Surplus Marketing Administration.
SPAB—Supply Priorities and Allocations Board.
SSB—Social Security Board.
SSS—Selective Service System.
TVA—Tennessee Valley Authority.
USCG—United States Coast Guard.
USDA—United States Department of Agriculture.
USES—United States Employment Service.
USHA—United States Housing Authority.
USIS—United States Information Service.
USMC—United States Marine Corps.
WPA—Work Projects Administration.
WPB—War Production Board.

New Jobs for Women—II

(Continued from page 24)

a balanced hot meal is one of the essential means of keeping up hourly production. Cafeterias to provide hot meals or hot nourishing food served from rolling canteens repay cost and trouble by stepping up production per worker. The Western Electric Company gives its employees light lunches during rest periods mornings and afternoons with excellent results in keeping up work schedules.

Rest periods during working hours have also been found to increase production materially. An unbroken work period of four or five hours, for instance, has proved to be too long. A rest period of from ten to fifteen minutes about the middle of the morning and again in the middle of the afternoon lifts production and acts as a hedge against fatigue. In some types of work a five-minute period every hour is recommended. Because fatigue is one of the big causes of absenteeism and a menace to the safety of workers, management must constantly guard against it.

Women's safety records are generally better than those of men, because women are likely to take safety precautions quite seriously. However, this applies only to experienced workers. The new workers in industry whether men or women generally increase the accident rate. As it is the woman worker who is the new worker today, women's safety records may slump for a time. Power machines cause two-thirds of women's permanent partial injuries and the punch press is responsible for one-half all machine accidents. All new workers need safety instruction, but perhaps women need it most, for the factory environment may be new to them and they are acquiring new skills.

One of the ways to prevent accidents among women workers is to require suitable work uniforms. These uniforms should be designed so that they cannot catch in machinery. They should be made of starched cotton fabrics which are more fire resistant than cellulose fabrics or unstarched cotton. Caps should be worn to prevent hair from becoming entangled in moving parts of machines; goggles should be required for certain work, and gloves worn when necessary to prevent accidents and injuries. Gloves, however, should not be worn around moving machinery. Well-fitting shoes with low heels are essential to safety, for falls are a major cause of women's injuries in factory work. Some accidents are caused by wet, slippery floors, but shoes play an important part in most accidents. Furthermore, properly-fitted shoes of the proper type for work reduce fatigue and nervousness. Jewelry is absolutely taboo because of the danger of its getting caught in moving machinery and causing painful injuries.

The Frankford Arsenal requires women workers to wear lightly starched cotton fabrics, and the uniforms are so fashioned that in case they do become ignited they can be removed quickly. Hair nets are mandatory not only because they keep long hair from contact with machinery, but they keep stray locks from becoming attracted by the static of machinery. The Ford Motor Company, which recently broke a forty-year precedent by employing women for heavy jobs, has banned the wearing of sweaters and skirts. The type of uniform sponsored is the coverall or jumper suit which allows these feminine workers to crawl over aircraft structures and into and out of difficult places with the freedom of men workers. The shapelessness of these uniforms also prevents distraction of the

INDEXING IS IMPORTANT, TOO

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If you or your employees spend precious time thumbing through books, papers, cards, etc., in search of the one you need . . . index your records with

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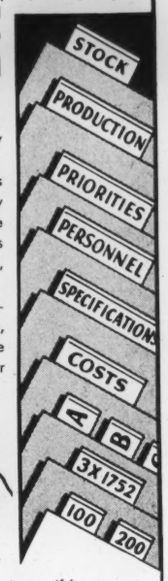

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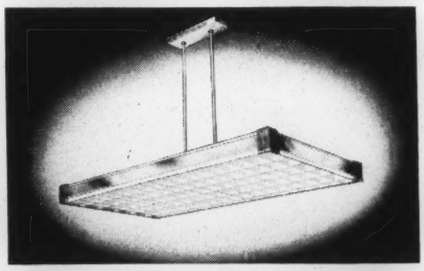

Speed office jobs with Fluorescent by the ACE

The Wakefield Ace gives high-intensity, diffused light; puts 90 per cent of its light *down* on desks or boards for faster, more accurate seeing, better work. "Tops" for office or drafting room. Helps check fatigue and reduce errors; helps maintain peak efficiency longer. Trim and compact. Especially helpful in rooms with poor ceilings. Maintenance cost is low. And it's a *Certified* Fleur-O-Lier. Write for details.

Today you must have the necessary WPB priority rating to buy fluorescent. Wakefield will be glad to work with you on this.

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men's attention from their work.

Management is usually loath to employ women in the more hazardous jobs where fire and explosion are a constant menace to the worker, although the work itself can be done as easily by women as by men. Workers in such jobs are selected for their emotional stability, as experience indicates that reactions of workers in hazardous occupations are more likely to be affected by individual differences than by the sex of the worker. Women, when carefully selected from this angle, have proved to be excellent workers and government arsenals are making use of many of them in such work.

The operation of saws is also hazardous and there is some question of the advisability of having women work with band, circular or other saws. Work on the final assembly lines in airplane factories involves crawling in and out of various passages, working in strained positions and working from high platforms, all of which may be undesirable work for women. These operations may be broken down, so that women may perform the less hazardous work. However, more and more women are being used for all types of work on final assembly with excellent results.

Many men, inexperienced in hiring women workers, worry about employing them on heavy work. Much of this worry is needless for in the average plant today, most of the heavy work is handled by machinery. There is, of course, always a certain amount of heavy work not suitable for women—hauling, heavy lifting, and general manual labor are better suited to men. But in most plants mechanical conveyance devices have been designed to meet almost every serious problem of weight lifting and carrying. This is particularly true in the aircraft plants because light tools are almost the only equipment used. Cranes, derricks, and jiggs are used to hold the pieces and parts as men and women work at them. Fortunately, in the last ten years, designers and engineers have so developed machine tools that their operation makes use of push buttons or easily handled levers, thus making such tools most suitable for women's use.

Wherever women must handle heavier work, workers can be trained as to proper methods of lifting weights. As the strength of the average woman is little more than half that of the average man, there are, of course, definite limitations on any weight lifting. These limitations are set forth in the pamphlet, *Lifting Heavy Weights in Defense Industries*, recently prepared by the Women's Bureau. Specific limits in weight lifting for women vary from 15 pounds to 75. Limitations are specific for girls under eighteen years of age, for there is likely to be damage to the body's bony framework and subsequent hindrance to child bearing in later years.

The matter of wage rates for women workers is likely to become a problem in some industries. Men fear women in industry because they consider their employment a way for management to force down wage rates. The solution lies in "equal pay for equal work." Prejudice against women workers on this score was difficult to handle when women were first inducted into war industries in England. Today in certain industries there is equal pay for equal work. But this arrangement came about only after many strikes and stoppages by men workers who felt that their pay rates were being threatened by the employment of women at lower rates. Eventually the problem was solved, for the time being, by an agreement between the metal workers and the government, providing for equal pay for equal work. Some of the other industrial firms in England soon followed suit. However, because women are not paid equal rates until after a probationary period (thirty-two weeks in engineering), because men work longer overtime, and because work has now been broken down in new plants so that jobs for many women are no longer the skilled jobs that men had been holding, women's earnings today are much less than men—only 44 per cent of men's earnings, to be exact. Fears that this condition may develop in the United States are not without foundation.

That this problem can become a serious difficulty is indicated by the strike in the fall of 1941 at the Kelsey-Hayes Wheel Company's new machine gun plant in a Detroit suburb. A two-day stoppage of work by the plant's 1,500 employees (United Automobile Workers) took place because the women on machines were being paid only 85 cents an hour (the prevailing wage rate for women in that area) whereas the standard rate for men was $1.00 an hour.

The rates set by the Secretary of Labor under the Public Contracts Act are, of course, required in plants in the various industries operating under contract with the Federal Government. All minimum rates set up under the Federal Fair Labor Standards Act must be complied with by establishments covered by the law. The act permits no wage differentials on the basis of age or sex. Naturally, existing state minimum wage rates must be complied with by all firms covered unless such rates are superseded by federal rates.

Because girls do not have the same opportunities in vocational schools to obtain a general mechanical training and background, and because they are not generally familiar with tools, the training of women in plants may require a bit more groundwork. However, girls are quick to learn and the entire training period is not slowed up appreciably by this training in fundamentals. Generally speaking, women should be trained in a special section before being assigned to any production room, especially for work in the divisions which hitherto have been staffed by men.

Human Relations in BUSINESS

Members of the firm of Carson Pirie Scott and Company at the dedication of the company's honor roll for employee service men

Companies Honor Employees in Service With Flags and Rosters of Names

With the war coming closer to home all the time, more and more companies are seeing that fitting honor is paid to their employees serving in the armed forces. Many have unfurled service flags on which are mounted stars, sometimes silver, sometimes blue, one for each employee serving Uncle Sam. An employee killed in action is honored by a gold star.

Other companies are displaying honor rolls listing the names of all employee-service men.

Commonwealth Edison Company, Chicago, unveiled an honor roll the middle of March which carried the names of more than 500 employees who have answered the call of their country. Just inside the main entrance to the store at State and Madison Streets, said to be the busiest corner in the world, Carson Pirie Scott and Company, Chicago, displays an honor roll listing all service men.

In addition to the honor roll placed in the central office of Commonwealth Edison Company, individual branches are hanging their own flags. One branch is displaying a service flag, designed by an employee, made of white cardboard, trimmed with red, with gold eagles in each corner and a blue star for each man in service.

In the lobby of the main building of the Illinois Bell Telephone Company hangs a flag containing 449 stars when originally hung. And the Chicago branch of Butler Brothers is honoring 365 service men with a similar flag. This flag also carries one gold star. In the enormous south well of Marshall Field and Company, Chicago, is a flag 40 feet wide and 60 feet long on which 607 blue stars and one gold star are shown. One of the largest flags being displayed hangs on the face of the American Telephone and Telegraph Company building in New York. It is several stories high and mounts stars representing several thousand A.T. and T. employees serving in the armed forces.

Dedication ceremonies, some simple, some elaborate, were held when these flags and honor rolls were first displayed.

More Ways to Increase War Bond Sales And Spur Payroll Deductions

The job of selling War Bonds and Stamps to employees continues unabated, with treasury recognition in the form of a Minute Man Flag being given to companies attaining the goal of 90 per cent of their personnel buying bonds. To spur bond buying, RCA Manufacturing Company, Inc., Camden, New Jersey, has opened a special booth on the first floor of its administration building which will be open six days a week from 8 a.m. to 5 p.m. It will be competently manned by representatives of the company's treasurer's department who are qualified to advise purchasers concerning details of bond buying. Stamps will be on sale and orders for bonds taken. Employees not already signed up under the payroll allotment plan may do so at this booth. A goal of $4,000,000 in bond sales in 1942 to employees has been set.

At Caterpillar Tractor Company a five-day campaign to register additional employees in the payroll deduction plan was held. Members of the Girls' Club set up four decorated booths throughout the plant and distributed information about the plan during shift changes and lunch periods. The company also maintains a cashier's office for any employees who wish to make outright purchases of bonds and stamps instead of by the usual deduction plan.

Campaigns have been stimulated by various charts showing progress. At the Chicago Mail Order Company a huge thermometer was placed in the lobby of the building with $100,000 as the quota. As sales went up, the mercury in the thermometer went up, and, incidentally, sales reached $245,000, instead of the hoped-for $100,000. At Swift and Company, charts were used at all units to show the percentage of employees participating in the payroll allotment plan. On it a tank was climbing a hill, and when 100 per cent of employees had subscribed, the tank had reached the top of the hill. In addition to small charts in each section, a large blow-up of the chart was displayed in the main Swift yard at the Union Stock Yards.

One of the booths set up by Caterpillar's Girls' Club to give information to employees about War Bonds and payroll deductions

Employees and Management Donate $15,000 To Navy on Special "Navy Day"

Employees and management of one of the West Coast's busiest war plants—the Cannon Electric Development Company of Los Angeles—are working round the clock with new enthusiasm following celebration of their personal Navy Day in which Navy officers accepted their offering of $15,000.

The check represented a three-shift Sunday's work at time and a half, contributed by employees. The management, under leadership of James H. Cannon, matched the $7,391.97 thus raised and increased it to make it a round $15,000.

Rear Admiral Joseph W. Defrees accepted the check on behalf of the Navy from Mrs. Marguerite Whitson, one of the original six girls who first formed a feminine contingent at the factory.

The ceremonies were held in a large section of the Cannon plant, which, with a temporary stage for band and speakers, had been fitted up as an auditorium for the occasion. The U. S. Naval Training Station Band from San Diego played, and colorful fleet signal pennants were hung over the area where the ceremony was held.

President Cannon, Mrs. Whitson, and Rear Admiral Defrees, main participants in the ceremonies of Cannon's special "Navy Day"

Payroll Deductions to Help Employees Meet Future Income Tax Payments

Realizing that next year's income tax payments are going to be pretty much of a problem for employees, Package Machinery Company of Springfield, Massachusetts, has formulated a plan for helping its workers to meet the new tax load.

Under the plan, the company deducts from the employee's pay an amount estimated to be sufficient to meet his income tax payments. This amount is forwarded to a local bank and set up to the employee's credit in a non-interest bearing account. When the quarterly tax installment comes due, the employee simply hands the slip to the cost department and signs a withdrawal authority. The cost department then sends it to the bank which mails the check to the government tax collector and charges the account. Whatever balance remains in the account after all tax installments are paid is placed in a regular interest bearing savings account to the employee's credit.

Taxes have been figured on the basis of earnings and exemptions and the company can tell the employee approximately how much he will have to have available for the four installments. Those employees who wish to have an additional amount deducted from their pay in order to start a savings account may do so. The employee's part in the transaction is just to fill out the Tax Club Withdrawal Order.

This plan was started December 16, 1941, to enable employees to accumulate sufficient funds before March 15 to pay the first installment of the tax. One hundred and forty-five employees took advantage of the plan which will now be continued throughout the year.

This portable desk and platform for receiving Red Cross donations at Kellogg is just an ordinary "converted" electric lift truck

Good Old-Fashioned Salesmanship Puts Over Red Cross Drives in Industry

Special drives are being waged in war plants to aid the Red Cross and other war relief agencies. At the Kellogg Switchboard and Supply Company, one afternoon during its Red Cross Drive an office-truck combination traveled up and down the aisles of the plant, stopping frequently to receive employee contributions. Contributions for that day amounted to more than $2,600.

The truck was rigged up by simple carpentry to do its job. It was a portable electric truck, on which a desk, donation box, and suitable place for the Red Cross nurses to stand was made, simply by extending prongs of the truck.

The company does not know just how much the stunt added to the results of the Red Cross Drive, but James B. Forgan, chairman of the Chicago Chapter of the Red Cross, commended the employees and the company because he considered the idea unique and helpful in attaining the subscription goal.

At the Edward G. Budd Manufacturing Company, the week of March 23 was designated as "General MacArthur Week," and impressive ceremonies attended by hundreds of Budd employees marked the opening of the week, as offerings and contributions to the Red Cross Fund poured in from Budd workers. Contributions to the Red Cross, as a tribute to MacArthur, were called for, and Red Cross booths were placed throughout the huge plant to receive donations in the drive held for a whole week.

Popularity of Slacks for Women in Factories Seeps into the Office

With slacks gaining in favor every day due to women wearing them in many war plants, some companies are lowering the unwritten bars and allowing women to wear them in offices, too.

The Chicago Mail Order Company recently announced that all employees may wear slacks to work if they so desire, and it was specifically stated that this applied to offices as well as merchandise departments. And in a speech the Illinois director of the United States Employment Service told the department's women employees that they may wear slacks if they wish.

In a number of war plants where girls are required to wear slacks to prevent dresses catching on machinery, uniform slacks have been adopted. In one department of Bausch and Lomb Optical Company the girls voluntarily adopted a uniform type of slack, in red, white, and blue—blue slacks, red suspenders, and white blouses.

SYSTEM and Business Management Ideas

Have you found a better way to perform some management activity? This department is a clearing house of ideas and methods that short-cut routine or increase sales. Regular space rates will be paid upon publication for each contribution used

1. "Secret" Form Cuts Inventory Cost

WITH mid-year inventory time approaching many readers will be interested in a form recently developed for one of the largest mail-order houses which has reduced inventory counting costs.

Usual custom where two people count stocks in bins, on shelves, and racks is for the clerk making the first count to write the number on a card, seal it in an envelope, and leave it in the bin or on the shelf where the merchandise counted is stored.

Later a second clerk comes along, makes a second count, and writes his number on the outside of the envelope. This means the use of a large number of cards and envelopes, and the plan consumes time in sealing and opening the envelopes, as well as extracting the cards for the comparison and reconciliation of the two figures.

International Tag and Salesbook Company developed a one-time, spot carbon, pasted form which effectively conceals the figure representing the first count until the form is torn open. The clerk making the first count writes the figure on a flap. Under this flap is a spot of carbon which copies the figure beneath a pasted-down sheet that can be opened only by tearing along a perforated line. After writing the figure on the flap, the flap is then torn off and destroyed. After the second figure has been written in by a second clerk, the entire form is taken to an auditing office, where the pasted down section is torn open and the first count revealed. Readers contemplating a physical inventory count should write for samples of this useful form.

2. Pays Double for Ideas In "Mac Arthur Month"

IN THE April issue of *Balco News*, Bausch and Lomb employee magazine, a double-page, center spread feature was used to announce a special suggestion campaign to be held from April 6 to May 9. This period has been named "Mac Arthur Month." The contest is being run in connection with the Production Drive now being waged by the WPB which has asked that suggestion campaigns be sponsored by industry, and the best ideas will be forwarded to Washington.

During Mac Arthur Month awards for all acceptable suggestions at Bausch and Lomb will double those usually paid, and, in addition, $5,000 in prizes ranging from $350 to $25 will be awarded. The ten departments submitting the best ideas will receive special banners identifying them as winners.

To spur employees to think of improvements and useful ideas, fourteen questions on which suggestions would be welcome were listed, and special blanks made available at convenient places throughout the plant. Rules were clearly stated, so that all employees could abide by them.

The suggestion plan at Bausch and Lomb is spotlighted in almost every issue of the employee magazine, thus constantly reminding employees that their ideas are wanted and will be paid for. Each month a report is published giving the amount of awards paid the previous month, who received them, and a general idea of what they were. Then, if suggestions on one particular topic or operation are especially needed, they are solicited in this way.

During March one employee submitted an idea worth $1,000, as well as a promotion, and a long feature was published to celebrate his achievement, with headline space announcing it on the cover.

In conjunction with the published notices of awards, the suggestion box always carries the amount paid for suggestions during this year and the highest award paid during the last month.

In connection with this program, instruction is being given to all those who handle boxes and cartons as to how to handle and open them properly so they will not be damaged and can be reused.

The company is also returning cylindrical paper spools carrying cotton yarn to its textile mill in Silvertown, Georgia, after being stripped. It is stated that millions of these spools are received at Goodrich annually.

3. Label Tells Customers Cartons Are Reused

BY REUSING containers and marking reused containers accordingly, H. A. Johnson Company, Boston, Massachusetts, manufacturer and wholesaler of food products and equipment, has been able to use about 3,000 containers that formerly had been thrown away. According to A. R. Turner, vice president, this has resulted in a considerable saving of paper and tin in the past two months.

The label which marks all reused containers is 9 by 3 inches and is divided into three stripes of red, white, and blue. Bearing the Johnson trade-mark and a row of airplanes with the V, the label announces, "This container reused to conserve for defense." Johnson's customers have appreciated the activity as one helping the war program.

4. Toledo Stores Open At Noon Mondays

TO MEET present-day conditions, the members of the Retail Merchants' Board of Toledo, Ohio, inaugurated a policy the middle of April whereby department stores remain open longer in the evening so that workers in war plants can have shopping time. Toledo store hours now are:

Monday	12 noon to 9 p.m.
Tuesday through Friday	9:45 a.m. to 5:30 p.m.
Saturday	9:45 a.m. to 5:45 p.m.

To aid in the publicizing of the plan, radio announcements, posters in factories, and newspaper publicity were used.

Similar plans have been put in operation in Cincinnati, Columbus, Dayton, and Canton, Ohio, and have proved very successful.

V Book of 1000 Prizes V

Here is the Prize Book that sets the pace for prize plans and campaigns. The New Dartnell V BOOK OF 1000 PRIZES is the most unusual, most advanced, and most attractive prize book ever made available.

A Complete Home

With blueprints, plans, and specifications the new Dartnell V Prize Book offers a complete home or any part of it from the egg beater to the house furnishings. Features 1000 prizes ranging in price from 25c to $100.

New Exclusive Features

How to Set the Table—How to Light Your Home—these and many other interesting features of appeal to homemakers make this Prize Book outstanding. It is new, different, and exciting!

Uses for this Prize Book

For a straight sales contest with prizes for your salesmen, agents, or dealers. Can be used for a "Beat Your Best" production prize plan for workers in the plant. Will help your company attain any objective involving extra effort on the part of employees, salesmen, or dealers.

How to Get Your Copy

Write today for a complimentary copy of this new Prize Book on your business letterheading. Be sure to state what use you have in mind for the prizes and Dartnell will be glad to work with you in developing a plan which will be effective.

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Prize and Contest Division
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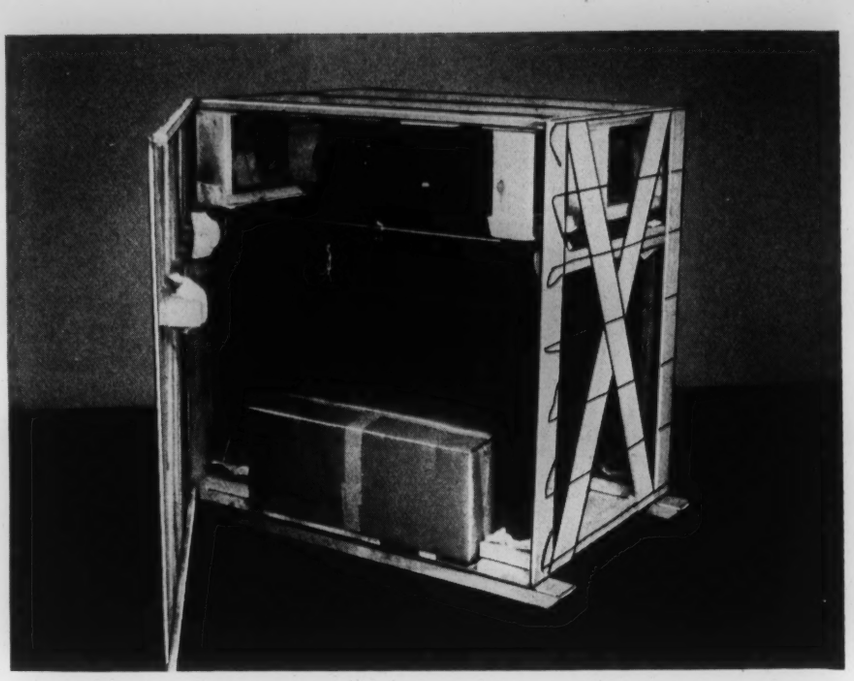


5. New Container Saves Shipping Weight

TO SPEED shipment and save weight, the General Box Company of Chicago has perfected a new, scientifically designed crate for the shipment of office machines. This pack consists of a one-piece, wrap around mat, a specially designed skid bottom, and crate top. It cuts tare weight by 48 pounds, important time is saved in packing, and handling was made easier and faster. It is also more attractive from an appearance standpoint.

6. Promotes Unadvertised Specials Daily

A PROMOTION idea which may be used by almost any store has proved successful at R. H. Macy and Company, New York department store. In specially designed racks placed at strategic points near entrances, a large supply of circulars containing special, unadvertised bargains for the day are available to all visitors to the store. On these racks signs proclaim, "Today's Unadvertised Hi-Spots."

The circulars are 8½ by 11 inches and contain a number of descriptions of special values for the day which have not been advertised in the newspapers. A recent circular carried sixteen items. Each day's circulars are dated, and they are changed daily.

It is stated that the plan has been successful in inducing customers to visit more departments than was their original intention when they entered the store.

7. Simplified Procedure For Plant Visitors

INSPECTION trips permitted through the plants of Victory manufacturers today are, as a rule, made by visitors who have special purposes, and whose time is limited. In order to conserve the time of important visitors to its plant, Reliance Electric and Engineering Company, of Cleveland, has, in recent months chartered air transports to expedite the arrival and return home of individuals coming from points distant enough to require overnight journeys by other means of transportation.

After arriving at the plant, visitors are given a specially prepared booklet, *Making Reliance Motors,* which is an exposition of the operations involved in making Reliance motors, generators, and other electrical equipment.

To make identification of departments and operations easier for the observer, cards bearing numbers corresponding with numbered paragraphs on the jacket are posted about the factory.

8. Salvage Department for Boxboard Cartons

SINCE the organization of a special department last year at the B. F. Goodrich Company, 34,000 cartons have been handled, renovated, and made available for reuse. At an average of 2 pounds each, this amounts to about 80,000 pounds of boxboard. Formerly, F. C. Hammon, chief package engineer of the company, states that these cartons would have been classified as scrap and sold as such. During the first three months of the department's operation, August, September, and October, a total of 15,627 cartons was sorted, reconditioned, and placed in stock for reuse. In November and December another 10,000 were salvaged, in January 5,717, with the number reclaimed in February dropping to 2,661.

One of the operations in making cartons ready for reuse is stripping all sealing and labels and blanking out all stenciling from the carton so as to eliminate all difficulty in resealing and marking.

New SYSTEMS *and* EQUIPMENT

Microfilm Reader for Accounting Work

PHOTOGRAPHY in accounting work, storing of census records, reproducing valuable documents and books in recent years has become more general. Several cameras have been developed for high-speed recording of railroad waybills and accounting records.

A new microfilm reader for projecting 35 mm. film, either perforated or unperforated, has been developed by Spencer Lens Company. It consists of a projection head, a glass film book, and a shadow box and screen.

Operation of the instrument is simple. The microfilm is placed in the glass film book and moved to show the desired copy by easy manipulation. The image is projected onto the special screen, flat and undistorted, and is so protected by the shadow box that a darkened room is unnecessary. Light can be adjusted to the comfort of the reader, and a screen of special tinted paper renders a projected image of agreeable color and contrast.

This Spencer microfilm reader will accommodate rolls of film from a few inches to several feet in length. For use with long rolls, a special roll film attachment to take rolls of film up to one hundred feet long is used.

Play-Back Recorder for Speech Training

ALTHOUGH originally intended largely for radio announcers, actors, and speech classes as an aid to speech improvement, Western Electric Company's Mirrophone should prove to be more or less of a godsend for everyone and anyone wishing to improve his voice. It will be found especially useful in training salesmen.

The device records the subject's speech magnetically on a steel tape. The flip of a switch provides for immediate playback. Thus subject may detect and correct errors of pronunciation, emphasis, tone, etc. As it records, the Mirrophone automatically erases—or demagnetizes—the previous recordings. The illustration above shows it in use.

The Mirrophone is being used by a number of radio stations, by scores of school and college speech classes and dramatic groups, and to train the thousands of new telephone operators and secretaries in war agencies and war industries. The many sales managers who have frequently expressed desire for such a device will probably lose no time getting in touch with Western Electric for full details about this new instrument to aid in speech training.

New, Noninflammable Type Cleaner

RELIANCE PENCIL CORPORATION has just brought out a new type cleaner, said to be very effective. It has been named "Durol," because of the advantage of name recognition in connection with Templar DurLead pencils. Durol comes in 3- and 8-ounce bottles with individual applicator and sealer on cap to prevent evaporation, and 16-ounce and quart sizes are available for refills for large offices equipped with many typewriters and office machines. The product will be marketed through stationery and typewriter supply dealers.

Windshield Decalcomania To Identify Employees

TO SIMPLIFY and speed up the checking necessary in controlling entry to war plants, the Jaco-Lac Decal Company has designed a windshield identification decalcomania which is serially numbered. With this windshield identification, guards can quickly check their lists of numbers assigned to cars authorized to enter company grounds, and time and trouble consumed in showing identification cards are saved. Frequent visitors, as well as employees, are supplied with decalcomanias.

HAVE YOU TRIED

Templar DUROLead
. . . the almost
UNBREAKABLE PENCIL?

● Ask your regular Stationer for a FREE Templar DUROLead pencil . . . and see for yourself why Executives, Office Managers, Purchasing Agents and Business People say:

● "NO BROKEN PENCIL-POINTS to interrupt important notations."

"LESS EMPLOYEE-TIME WASTED at the Pencil Sharpener."

"WE GET LONGER SERVICE from every Templar DUROLead pencil."

FREE SAMPLES: If Your Regular Stationer has no Test Samples of Templar DUROLead, just write to us on your business letterhead and we'll send them! Please specify degree—1, 1½, 2, 2½, 3, 4.

Mail Today to Dept. C5.

RELIANCE PENCIL CORP.
Manufacturers — Mt. Vernon, N. Y.

THE PREFIXT WAY

A

New, Modern Method for making copies of business correspondence.

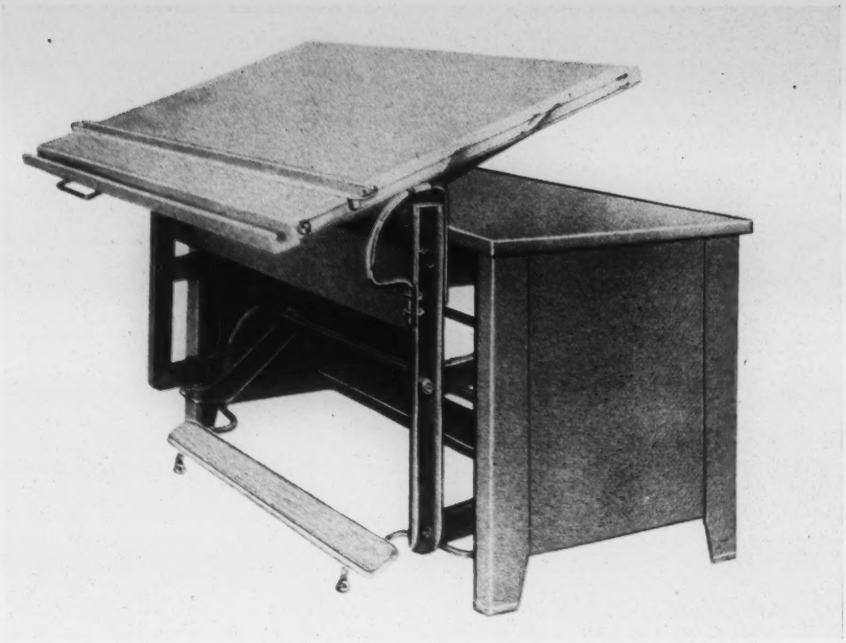
Saves Time, Money and Temper

One quick snapout separates letterhead and second sheet. Carbon paper remains in "Prefixt" form, ready for the next letter.

Attach this ad to your letterhead for Free Samples and complete information.

NEWPORT NEWS FORMS CO., Inc.
Newport News, Va.
SOLE MANUFACTURERS

● OFFICE SUPPLY DEALERS ●
SOME TERRITORIES STILL OPEN
A money-making repeat item.
Write for information.



Adjustable Drafting Table

FOR speeding up drafting work and reducing the fatigue factor, Hamilton Manufacturing Company has developed an Auto-Shift Drawing Table. The top of the new table is easily adjustable from a horizontal position to any angle by merely releasing a hand lever directly under the drawing board top, and the table top is adjustable to the desired height by releasing a foot lever. Because of the adjustments, draftsmen can work at the tables either in a seated or standing position.

When a number of Auto-Shift tables are placed in a row, one in front of the other, each draftsman uses the drawers of the table directly behind him and also the top of that desk as a reference surface. This saves floor space, making separate reference tables unnecessary.

The table comes in three drawing board top sizes: 36 by 60 inches; 36 by 72 inches; and 42 by 72 inches. Each table is furnished with one reference drawer and one tool drawer.

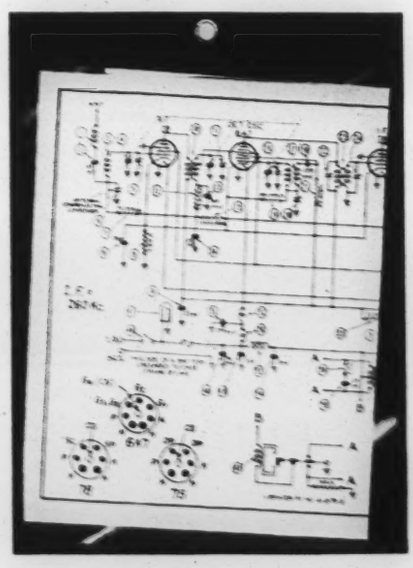
Clock to Make Employees Time Conscious

A NEW "Victory Telometer" clock acts as a stimulant against wasted time with its "V," "Remember Pearl Harbor," "Make Every Minute Count!" and American flag on the front of the case. The overall measurements of the clock are 19⅝ by 14½ by 5½ inches, and the numerals are white on a black background, 2 inches high and visible at a distance. They read timetable fashion—as 10:22—rather than by use of the conventional hands and dial. The Telometer operates on alternating current, powered by a self-starting electric synchronous motor. It is manufactured and distributed by M. M. Goetlieb Associates.

Transparent Holder to Protect Job Tickets

TRANSPARENT-FACED shop ticket holders for keeping vital information, production orders, specifications, blueprints and schedules, etc., right with the job are being marketed by G. J. Aigner Company. The standard size holder, made to accommodate an 8½ by 11 inch sheet is of job ticket type construction. It has an 8¾ by 11 inch transparent celluloid front which is stitched at the bottom and on the sides to a 9½ by 12⅜ inch durable backing with imitation leather edge binding and an eyelet at the top. Thus the contents are readily visible at all times, yet protected from dirt and wear.

Special ticket holders have been made according to customers' specifications ranging in size from celluloid folders for employee identification cards to multiple fold envelopes for designs and blueprints.



Business TIPS

The following literature is of special interest to executives active in business management. Unless otherwise stated, it will be sent upon request to either the company or editors of AMERICAN BUSINESS.

Discusses Subcontracting For War Orders

IN AN effort to help manufacturers, the Policyholders Service Bureau of the Metropolitan Life Insurance Company has prepared a treatise, *Subcontracting for Defense.* While the material for this booklet was gathered before the shake-up of the OPM and the emergence of the WPB, most of the information is still pertinent and worth the study of any company seeking war work. Diagrams and charts show the organization of subcontract work in the prime contracting company and how production schedules and machine load charts are made. Explanation is given of ways prime contractors select and appraise subcontractors. On three pages a typical subcontractor's description of production facilities is reproduced. From there the booklet goes on to tell the subcontractor how to obtain work and what assistance the subcontractor can expect to receive from the prime contractor. Production control is another subject discussed, with charts given to show progress.

What About Bags for Shipping Purposes?

WITH business pressed on all sides to save shipping containers and to find substitute shipping methods, the Bemis Bros. Bag Company offers one solution in its bulletin, *A Guide to More Efficient Shipping.* This bulletin is in the form of a quiz, asking questions and answering them. Such things are discussed as "How Are Bemis Waterproof Bags Made?" " . . . Filled?" " . . . Closed?" "What About Labeling and Printing?" etc.

The Problem of the Night Watchman

WITH the precautions against sabotage becoming every day more necessary, many readers will be interested to read the discussion of the night watchman problem which appears in the December 1941 issue of *American Mutual Magazine,* the house magazine of the American Mutual Liability Insurance Company. Called "Sentry—After Sundown," the article discusses the qualifications for efficient watchmen, causes for watchmen's failures, points on which all watchmen should be trained. Part of the article is based on information supplied by the American District Telegraph Company, well-known watchmen's service company.

Remington Rand Buyer's Guide with Prices

REMINGTON RAND has issued a new *Office Manual of Loose-Leaf Equipment* which reverses the company's long-standing policy of making a catalog a buyer's guide and not a price book. In the new catalog prices are quoted and buyers have complete data. This change was made in order to meet the situation presented by a somewhat depleted selling staff, making coverage of the small consumer in the out-of-the-way towns difficult. All types of binders for office forms, visible sales presentation equipment, loose-leaf binders, index tabs, and proposal covers are included in this catalog. Remington Rand plans to issue similar catalogs for the products of all of its other divisions.

Tells How Heat Treating Aids War Production

TO SHOW the part it is playing in war production, Surface Combustion Corporation has issued a booklet, *The Great American Emergency.* In it is shown how the company's heat treating furnaces are being used in making cartridge cases, projectiles, bombs, cartridge belt links, gun barrels, gun carriages and mounts, armor plate, airplanes, engine parts, and high-speed tools. An insert contains pictures of various Surface Combustion furnaces at work producing war materials. The booklet not only tells how its products are being used, but explains the processes, too. As a closing, a word on the use of heat treating furnaces after the war is given.

GM's Suggestions on Care of Autos

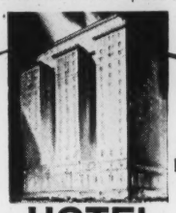
HERE'S a booklet which every car driver will want to see, read, and keep. It's the *User's Guide* put out by the Customer Research Staff of General Motors. It contains information about saving gas, tires, proper lubrication, keeping your car fit, how to use the brakes and clutch to cause least wear, driving habits, and highway driving hints. In the whole booklet there is only one page of advertising—it is really intended to make customers satisfied with what they already have rather than wanting something new which is unobtainable.

The Story of Burroughs

AN INSTITUTIONAL booklet, *The Organization Behind the Products,* is being distributed by Burroughs Adding Machine Company. In it an over-all picture of Burroughs is given from the invention

AT YOUR *Elbow*

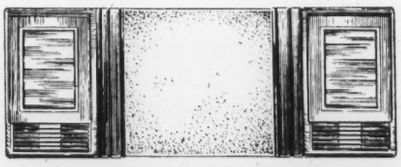
At The Roosevelt everything that makes New York so interesting is right at your elbow. Step off your train at Grand Central, follow the private passageway direct to The Roosevelt, enjoy friendlier service . . . cheerful, spacious rooms . . . delicious food . . . and a restful atmosphere that have endeared The Roosevelt to its guests year after year. Attractive rooms with bath from $4.50.



FRANKIE MASTERS and his Orchestra in the ROOSEVELT GRILL Nightly except Sundays

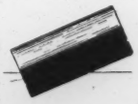
HOTEL ROOSEVELT
MADISON AVE. AT 45th ST., NEW YORK
BERNAM G. HINES, *Managing Director*

JACO-LAC DECAL CO.
188 W. RANDOLPH
HIGH QUALITY—LOW PRICES
Immediate service on
STOCK DESIGNS—NAME PLATES
Chicago Factory
Letters and numerals carried in stock—Low priced truck transfers and special designs made to your order. Experienced consultants and complete Art Service for your individual problems.
JACO-LAC DECAL CO.
Dept. 50, 188 W. Randolph St., Chicago, Ill.



DeLuxe Folding Distributor and Desk Pad
Size 48x24 open—19x24 closed. Has 2 work distributors with 6 refillable work pockets each. Felt padded. Many features demanded by particular executives. Price $15.

MODERN INDEX HOLDER
100% visibility. Metal with celluloid index holder. Easy to attach. Standard or special sizes. Prices and samples on request.



Modern Desk Pad Co., 118 W. Hubbard, Chicago

REPRESENTATION
Two business men operating a successful business in Chicago, traveling the Central States, selling exclusively to manufacturing concerns, would like to get in touch with some medium sized manufacturer needing representation in this territory.
Write AMERICAN BUSINESS, Box 54

Where To Buy It

Steel Signals

Signal vital facts with Cook's File Signals—automatic reminders, invaluable for classifying, indexing data. Card of actual samples (all styles, colors) free; no obligation.

THE H. C. COOK CO. 38 Beaver St. Ansonia, Conn.

COOK'S STAINLESS STEEL FILE SIGNALS

Steel Guide Tabs

Unbreakable spring jaws clamp them firmly to cards but permit removal or rearrangement.

Large openings covered by transparent pyroxylin, white, blue, green, yellow, pink or red.

Insertable labels in perforated strips for typing.

2 Sizes, 1 in. wide and 2 in. Tops straight, or bent back.

Sold by best stationers, U.S. and foreign, or sent postpaid to responsible firms on 30 days trial. Price list free.

Samples (5 or less) 2 cents each

31,000 Angle Type used by Connecticut State Employment Service

CHAS. C. SMITH, Mfr., Box 345, Exeter, Nebr.

Advertising Novelties

Help maintain civilian morale and improve your business at the same time. Place your name before your customers with Patriotic Mechanical Pencils, Exclusive Art Calendars, Safety First Cases, Patriotic Letter Enclosures, Plastic Match Cases, Windshield Wipers, countless other items. Inexpensive, resultful.

ADVERTISERS PUBLISHING CO.
Dept. AB-1, Ann Arbor, Michigan

Salesmen Wanted

Will You Wear This Suit?

AND MAKE UP TO $10 PER DAY?

Let us send you a fine all wool tailored suit FREE of not one penny cost. Just follow our easy plan and show the suit to your friends. Partial payment plan. No experience—no house to house canvassing.

SEND FOR SAMPLE—FREE OF COST

Write today. Send us your suit size and color preferred.

RIALTO TAILORING CO., Gillespie, Ill.

CUT COSTS WITH

DARTNELL FORMS

SAVE TIME AND MONEY

SALESMAN'S APPLICATION BLANK — Used by more than 3,000 concerns to find weak points in applicants for positions as salesmen. A four-page form embodying the best features of many forms. 8½ x 11 inches.

Other Dartnell forms are: General Application Blanks; Expense Account Forms; Automobile Expense Books; Auto Expense Blanks; Salesmen's Reference Forms.

Write for FREE Samples

DARTNELL CORPORATION
Publishers
4660 RAVENSWOOD AVENUE
CHICAGO, ILLINOIS

Desk Accessories

Olive Green Art Steel

LETTER RACK

Saves time. Clears your desk for action. A place for every paper. Needed on every desk.

( ) Letter Size $5.50 } F.O.B.
( ) Cap Size $6.50 } *Factory*

Check size and quantity desired. Send your order today.

Currier Manufacturing Co.
21 N. W. Terminal Building
Minneapolis, Minn.

House Organs

SAVE MONEY on your HOUSE ORGAN

SPECIALIZING ON MAGAzines makes it possible for you to obtain your house organ, employee's magazine, etc., at less than one-half usual prices. Free samples, particulars, etc.

NATIONAL PUBLISHERS PRESS
523 Ottawa, Grand Rapids, Mich.

Mailing Lists

CAN YOU USE EXTRA CHECKS?

Mass Mailer clients send you substantial checks through us for your addressing empty envelopes YOUR lists, if responsive.

RUSH FULL DETAILS ABOUT YOUR LISTS

MOSELY
230 (AB-5) Congress St., Boston

of the first adding machine by William Seward Burroughs to the present-day organization the company maintains. Burroughs' salesmen's capabilities and qualifications are discussed, as well as the work of the service men who are factory-trained and the research organization which has developed the more than 400 machines in the Burroughs line of office machines.

Shows Ways to Cut Production Time

OF INTEREST to production managers will be the catalog of O'Neil-Irwin Manufacturing Company, *Metal Duplicating Without Dies.* This company manufactures three machines, the Di-Acro bender, brake, and shear, with which accuracy of all duplicated work to die tolerance of .001 can be obtained without the use of dies which take much time to make. The catalog not only shows the Di-Acro machines, but illustrates in close-up pictures their operation, parts, and some of the pieces and parts which they can produce. On one page are a number of questions and answers about the Di-Acro system.

Picture Story About Machines in Action

CONTINENTAL MACHINES, INC., has also produced a booklet, spiral-bound with plastic, showing its Doall contour machines in operation. It is a picture booklet, and includes pictures taken in aircraft plants, arsenals, industrial and naval ordnance plants. Each photo shows different applications for this contour machining process, and jigs, fixtures, and attachments to facilitate this machining are clearly shown. The booklet can be used for reference by plant production engineers, instructors, and students. It is called *Doalls in Production.*

Reports on Piecework Payroll Problems

WHERE workers are paid on the piecework plan the accounting problem becomes extremely burdensome unless the right labor-saving methods are used. Saul Brothers, whose systems are in use in a number of industries, have recently prepared for distribution a number of excellent reports on piecework payroll problems. The Saul system is a simplified accounting method with an absolute control of piecework payroll costs through the use of coupons used by the workers to collect their pay. Under this system of payments to workers, there can be no possibility of paying for work which was not performed. Special studies have been made for the following industries: Hats, shirts and pajamas, knit wear, dresses, underwear, men's clothing, wash dresses, lingerie, gloves. Manufacturers, by indicating which line of business they are interested in, may obtain a copy of the report applying to that business. Write the editor.

THE BUSINESS MARKET PLACE

HARRY K. GOODALL, Classified Advertising Manager

It will pay you as a reader of AMERICAN BUSINESS to read these announcements. Answer those that interest you, so that the advertiser can present the full facts of his proposition by mail. If you have something to advertise yourself, send in your own sales message. The cost is small. RATES. *Ordinary Classified.* 20 cents per word. First line in six point boldface type and centered—$1.00. White space $1.00 per agate line. *Display Classified.* 1 inch: $14.00; ½ inch: $7.00. $12.00 and $6.30 respectively on 12 time contract. Terms: Cash with order unless credit references are submitted and approved. Forms close 20th of preceding month. Published 1st of month of issue.

Letter Gadgets

A GOOD LETTER GADGET will keep your letters on top of the desk with some chance of doing business. Wastebasket letters cannot talk. Write for illustrated circular. A. MITCHELL, R275, 326 N. Michigan Ave., Chicago.

Incorporating Services

DELAWARE CHARTERS: Complete service $35. Submitted forms. CHAS. G. GUYER, INC., Wilmington, Delaware.

DELAWARE CORPORATIONS organized and represented; request free forms. COLONIAL CHARTER COMPANY, Wilmington, Delaware.

INCORPORATE! Information free. Write: INCORPORATING BUREAU, PHILIP LAWRENCE, Huron, S. D.

New York Mail Service

PERSONAL AND BUSINESS MAIL received and reforwarded. DUNN MAIL SYSTEM, Box 42, 216 West 69th Street, New York, N. Y.

Business Opportunities

MAIL ORDER'S MISSING LINK. Permit to Publish Copyrighted Material. Marks new Era. Details free. MAUPIN, 327 28th, LaFayette, Indiana.

FREE TREATISE ON CLASSIFIED ADVERTISING You'll find a few helpful hints on "HOW TO PREPARE PRODUCTIVE CLASSIFIED ADVERTISING" in our free monograph of that title. If interested in classified advertising from any angle, write for your free copy TODAY. AMERICAN BUSINESS, 4660 Ravenswood Avenue, Chicago.

Business Services

LETTERS — POSTCARDS ADDRESSED, 1c each—Buying Lists—OZARK ADVERTIZERS, Ironton, Missouri.

Credits and Collections

LEARN ACCOUNT COLLECTING. Good income: quick results. Interesting folder free. NATIONAL COLLECTORS ASSOCIATION, Newark, Ohio.

Used Business Equipment

WHAT OFFICE EQUIPMENT DO YOU NEED or want to sell? We buy and sell all kinds of office equipment, specializing in Visible Equipment, such as Kardex, Acme, International Visible and other makes. Write us.
E. H. HEINEMAN, 4 N. 8th St., St. Louis, Mo.

ELLIOTT FISHER, Moon Hopkins, Adding, Calculating, all makes office machines. ROBERT NOVAK, 529 So. Wells, Chicago.

WHAT DO YOU WANT TO SELL? We buy and sell all kinds of office equipment. Write us. CHECK WRITER CO., INC., 169 Williams St., New York.

For Advertisers

Mr. Classified Advertiser: Ask for proof of profitable results obtained from classified advertising in AMERICAN BUSINESS. Address: Harry K. Goodall, C. A. M., 4660 Ravenswood Avenue, Chicago.

Executives Wanted

SALARIED POSITIONS
$2,500 to $25,000

This thoroughly organized advertising service of 32 years' recognized standing and reputation carries on preliminary negotiations for positions of the caliber indicated above, through a procedure individualized to each client's personal requirements. Several weeks are required to negotiate and each individual must finance the moderate cost of his own campaign. Retaining fee protected by refund provision as stipulated in our agreement. Identity is covered and, if employed, present position protected. If your salary has been $2,500 or more, send only name and address for details.

R. W. BIXBY, Inc.
201 Delward Bldg., Buffalo, N. Y.

EXECUTIVES $2,400—$25,000

This reliable service, established 1927, conducts confidential negotiations for high-grade men who either seek a change, or the opportunity of considering one, under conditions assuring, if employed, full protection to present positions. Send name and address only for details.
JIRA THAYER JENNINGS
Dept. B—9 Center Street, New Haven, Conn.

SILVER ANNIVERSARY!

One of the classified advertisers on this page has recently completed twenty-five years of continuous advertising in AMERICAN BUSINESS and *System*. In a quarter of a century, they have not missed a single issue. Read what they write us.

> "Continue my classified advertising for another year. The results have been so satisfactory that I am glad to give you this order. We assure you we appreciate the years of results you have given us." (signed) PRUITT, Otto E. Pruitt, Pres.

See their ad under "Used Office Machines." Consider using a classified ad yourself if you wish to reach the better type of executives and business men. Send your order or request for further information to

Classified Advertising Manager
AMERICAN BUSINESS
4660 Ravenswood Avenue, Chicago

Job Consultants

GET THE BETTER JOB, and keep it, by the Gatto System, of analysis advice and guidance. Efficient, time-tested, reasonable. Free booklet. GATTO ASSOCIATES, Box 74, Trenton, N. J.

For Sales Managers

SALESMEN'S APPLICATION BLANKS used by more than 900 leading companies for quickly grading applicants for sales positions —4 pages—$6.00 per hundred. Also expense account forms, reference forms, auto expense account forms, etc. THE DARTNELL PRESS, 1801 Leland Avenue, Chicago.

Advertising Agencies

YOUR AGENTS, mail order advertisement inserted all newspapers, magazines. Publishers' rates. MARTIN ADVERTISING AGENCY, 171B Madison Avenue, New York.

NEWSPAPER, Magazine, Mailing-list Ratebook, Free. CHICAGO ADVERTISING AGENCY, 20-A West Jackson, Chicago.

Advertising Services

ADVERTISING COPY, LAYOUTS, literature, expertly prepared. Send complete particulars for estimate and advice. ROBERT PETERSON, 400 W. Madison, Chicago.

Sales Letters

HOW TO ESTABLISH YOUR BUSINESS! Now's the time for mail campaigns. Establish yourself for the future! Write HUTZLER ADVERTISING AGENCY, Dayton, Ohio.

Mailing Lists

NATIONAL COMPILATIONS
(A) 20-44-year-old registrants, (B) July 1, 1941, 21-year-old registrants, (C) Men in the Services, (D) Men and women engaged in war production activities. Thousands of other classifications. Without charge we suggest prospects, analyze literature and recommend tests to be made.
WESTERN ADVERTISING SERVICE
401-406—Phoenix Building, Minneapolis, Minn.

PRODUCTIVE Mailing Lists
Many classifications, latest dates. RABIRO SERVICE (AB), 228 2nd Street, New York.

Inventions for Sale

EXPLOIT NEW INVENTIONS and make money. Write for our free classification sheet of inventions for sale. ADAM FISHER CO., 41 Enright, St. Louis, Mo.

Used Office Machines

MIMEOGRAPH, Multigraph, Addressograph, Folder, Dictaphone. Send for FREE bargain circular on office machines. PRUITT, 37 Pruitt Bldg., Chicago.

Printing of All Kinds

MR. PRINTER: Present your little sales message to the business executive subscribers and other serious readers of AMERICAN BUSINESS in a classified advertisement under this classification. Send your "copy" now for the next issue or write for further information. Address: Classified Manager, AMERICAN BUSINESS, 4660 Ravenswood Avenue, Chicago.

Postcard Advertising

Make your POSTCARD ADVERTISING dynamic, colorful, attention-arresting! Economically priced FLASH POSTCARDS will give your message the "punch" it needs to knock over sales. Send for samples. KUPFER PRINTING COMPANY, 503 South Jefferson Street, Chicago, Illinois.

Accountants

ACCOUNTANTS AND BOOKKEEPERS. Real profit from new type bookkeeping service. Write ASCO, Box 1468, Springfield, Mass.

SOUND-SLIDEFILMS FOR SALES TRAINING

The Dartnell Corporation now has available three outstanding sound-slidefilms for sales training, sales meetings and for showing as a feature at sales conventions. The films now available are as follows:

"STRATEGY IN SELLING"

Based on the Dartnell manuals of the same name these sound-slidefilms dramatize the fundamentals of industrial and specialty salesmanship. Titles of the seven films are:

1. Planning the Sale
2. Getting Better Interviews
3. Making the Presentation
4. Disposing of Objections
5. Closing the Sale
6. Managing Your Time
7. The Way to Leadership

"RETAIL SALESMANSHIP"

Produced for training retail salespeople and dealers' personnel, the seven sound-slidefilms in this series are applicable to any kind of retail sales training operation.

1. Making Customers Welcome
2. Need for Merchandise Knowledge
3. How to Use Suggestion Selling
4. Handling Customers' Objections
5. Helping Customers to Buy
6. Developing Sales Personality
7. Winning Friends for a Store

"SELLING LIFE INSURANCE"

Just completed, this series of seven sound-slidefilms which Dartnell produced in collaboration with R. & R. is ready for distribution.

Dealing specifically with the technique of selling life insurance, this series should be in the hands of every organization engaged in life underwriting.

* * *

Outline scripts and full details of these sound-slidefilms will be sent on request.

THE DARTNELL CORPORATION
4660 Ravenswood Avenue
CHICAGO, ILLINOIS

NEW BOOKS *for Executives*

THE PUBLIC SPEAKER'S TREASURE CHEST. By Herbert V. Prochnow. No other nation on earth would suffer through the bad speeches that America submits itself to every day. From ten thousand luncheon clubs and many more other groups pour forth an avalanche of words each day. Most of the speakers come to the platform with but the haziest idea of what they intend to say. Some speakers even have the colossal effrontery to begin their speeches with a statement that they have not had time to prepare the speech. At this point we often wish for the old custom of hissing, for such speakers should be hissed off the platform. But that's America—good-natured to the limit. Here is a book which will help the army of volunteer speechmakers understand that making a passable public talk is a matter of some preparation, and it contains many of the seeds of a good talk. There are 1,000 jokes, 500 epigrams, 200 definitions, claimed by the publishers to be "amusing," 1,200 quotations, 173 colorful phrases, plus specific instructions on how to write an interesting speech. We vote for this book as required reading to all who aspire to platform performance. Harper and Brothers. $3.50.

BUSINESS EXECUTIVE'S HANDBOOK. Stanley M. Brown and Lillian Doris. Second edition of the handbook of which 40,000 of the first edition were sold. This edition is revised and enlarged. The first edition, published in 1939 contained 1,281 pages; this edition 1,600 pages. In many of the chapters there has been a distinct improvement in illustration, in bringing such things as forms and charts up to date. There is some room for improvement in this respect as some of the forms illustrated are far from the best of their kind, but this is a minor objection. On the whole the book is an excellent job, and one which any business man will find occasion to use in almost daily reference. Prentice-Hall, Inc. $7.50.

PATENTS AND ANTITRUST LAW. By Laurence I. Wood. If we judge this book by the quality of its printing and the obsolete typography we would condemn it bitterly. But it is wholly unfair to penalize the author because the publishers are not smart enough to employ a good book designer, or to patronize a printer who uses modern type. Nevertheless a book so poorly manufactured as this one cannot but arouse doubts in the mind of the reviewer. Actually the book is an authoritative discussion of present trends in patent cases in various phases of antitrust law. Naturally the activities of Thurman Arnold came in for much comment. The author has carefully documented every statement and all sources are clearly indicated in footnotes. Commerce Clearing House, Inc. $3.50.

FINANCING THE WAR. A comprehensive study of tax problems, the first to be published since the United States entered the war. It is a kind of blueprint for the nation to follow if we are to avoid the devastating spiral of inflation which threatens. The book is a compilation of the work of many leading economists and tax experts and was compiled by the Tax Institute which is integrated with the Wharton School of Finance and Commerce. Tax Institute. $2.50.

MECHANICS OF BUSINESS LETTER WRITING. By Benjamin R. Haynes and Irol Whitmore. This booklet contains tables, charts, and suggestions to help stenographers improve the appearance of their letters, and could be used in many offices which have not prepared manuals for their own organization. Division of University Extension. The University of Tennessee. 50 cents.

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DARTNELL PRESS, CHICAGO

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to
ALL EMPLOYERS
★ From the United States Treasury Department ★

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MAKE EVERY PAY-DAY . . . BOND DAY!

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This space is a contribution to NATIONAL DEFENSE by "American Business"

ANNOUNCING A NEW 15-MINUTE SOUND-SLIDEFILM PRODUCTION

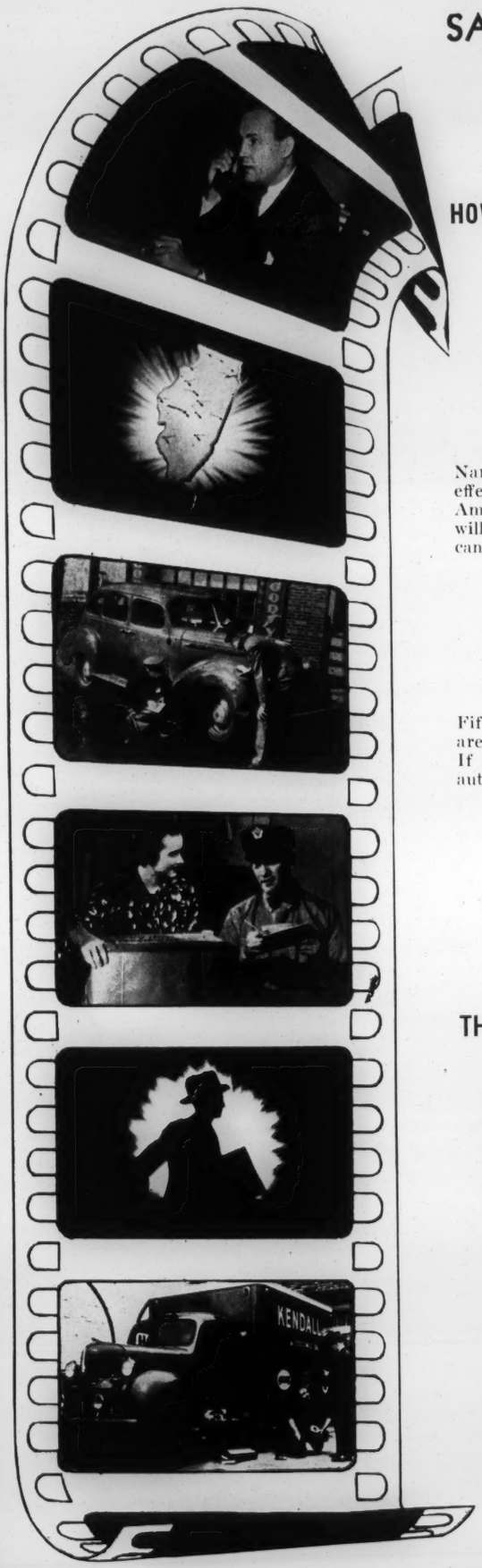
for showing to your

SALESMEN, FIELD SERVICEMEN, and DRIVERS

titled

"Keep Yours Rolling"

HOW TO DOUBLE THE REMAINING MILEAGE IN YOUR CAR AND TIRES



If you operate salesmen's cars or light delivery vehicles then this new fifteen-minute sound-slidefilm is just what you are looking for. You want to get your drivers to make their cars and tires last as long as possible. More than anything else, this new sound-slidefilm will get them to do it. They will SEE and HEAR on the screen real-life incidents that will impress on them the urgent need for conserving their automobiles starting today. They will SEE and HEAR how bad driving practices cut off mileage. They will SEE and HEAR how they can contribute to the war effort by starting right now to squeeze those extra miles out of their equipment—miles which may mean a good deal to your business in a few months.

Narrated by Vincent Pelletier, famous radio commentator, with incidental music and sound effects, the dramatized sequences in this film will impress every automobile driver. Every American who drives for business purposes should see it. It is a stirring presentation that will not only build morale but get over so much practical material on car conservation which cannot be shown in bulletins and other reading matter.

AN OUTLINE OF THE SCRIPT

How salesmen and delivery men have contributed to the building of America—The situation they currently face—Dramatization showing exactly why present equipment must be made to last—A serio-comedy sequence showing what happened to the "know it all" driver who would not heed the warnings—An analysis which shows drivers how to budget their mileage—A "passing parade" of the things to do to increase the driving life of a car.

Fifteen minutes at a meeting showing this sound-slidefilm to all your drivers whether they are salesmen, service men, delivery men, or war plant workers will be a good investment. If you do not have a sound-slidefilm projector one can usually be borrowed from a local automobile dealer. No union operator needed. Anyone can operate the machine.

One copy of this film and record for your exclusive, permanent use . . . . Price $30

Now Being Shown by

Swift & Company	Georgia Power Co.	Oertel Brewing Co.
Crown City Dairy Co.	Westinghouse Co.	McCray Refrigerator Co.
Columbia Steel Co.	Bowman Dairy Co.	Seven-Up Iowa Co.
Standard Oil Company	Orange-Crush Co.	Jordan Marsh Co.
E. I. du Pont de Nemours	Allied Mills, Inc.	Liberty Mutual Ins. Co.

Produced and Distributed by

THE DARTNELL CORPORATION, 4660 Ravenswood Ave., Chicago

THE DARTNELL CORPORATION
4660 Ravenswood Avenue
Chicago, Illinois 1942

Send immediately your new 15-minute sound-slidefilm titled "KEEP YOURS ROLLING." Bill company when shipped at $30. Kit includes film, 16-inch double-sided record and Meeting Guide with suggested talk for person conducting showing.

☐ We already have a sound-slidefilm projector

☐ We do not have a projector. Advise where we could get the use of one.

Individual..... *Position*.....

Company.....

Street.....

City..... *State*.....

(Illinois 2 per cent sales tax added when applicable. Bill to company unless otherwise specified.)

OCCUPATIONS - PAPER & PULP

Rf copy
Wm history
Paper

November 11, 1942

Mr. R. A. Day, Personnel Manager
A. P. W. Paper Company
Bridge Street
Albany, New York

My dear Mr. Day:

Your letter to the Bureau of Labor Statistics, sending them your Labor Agreement, was referred to us because of your request in regard to woman employment.

We do not have recent information in regard to the replacement of men with women in the paper industries. However, we do have a good deal of information obtained from time to time by our field agents as to the actual operations women have been performing in various paper products industries. These will give you an indication of the kinds of jobs in which the employment of women could be increased. In paper and paper board mills about 10 percent of the employees in 1939 were women, a total of more than 11,000. In a large number of industries making various paper products (such as containers, bags, envelopes, facial tissues, towels, wallpaper, and a number of others) about 57,000 women were employed, these being more than one-third of the total labor force.

In these industries women were doing various types of inspecting and they were cutting, counting, sorting, labeling, jogging, assembling sheets, wrapping, and packing. They were rollers and tail rollers in wallpaper plants and rag sorters in paper mills. Some women were doing most types of lighter press operations. I am attaching also a list of machine processes in which our field agents have found women employed in paper mills.

In industries devoted to many types of war production, our agents are finding great increases in numbers of women on jobs such as women have formerly done and they also are finding numbers of women now performing types of jobs formerly done only by men. In a particular plant or industry estimates as to the types of work on which women could be placed could best be made by a job analysis in plants within the industry. Women's Bureau agents have made various job analyses of this type in industries such as aircraft, ammunition making, and so forth.

Hoping this information may be helpful to you, I am

Sincerely yours,

Mary Anderson, Director

MEP:ml
Enclosure

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

Nov. 1942

OCCUPATIONS OF WOMEN IN VARIOUS PAPER PRODUCTS INDUSTRIES

FOOD DISH, PULP AND PAPER PLATES

Beating out plates
Cup-forming machine feeder
Cup bottoming machine
Punch press feeder
Spoon and fork machine operator
Scalloping napkins on punch press
Operating a four-corner stampling machine
Roll-packing -waxed paper (machine)

FLUTED CUP, PAN LINER, AND LACE PAPER

Cup machine tenders
Chiseling (kick press operation)
Corner stayer
Cutting cup tops
Embossed seal machine
Feeding paraffin machine
Grooving cups
Stitching cartons on wire stitcher

GLAZED AND FANCY PAPER

Box stayer
Crepe paper machine operator
Feeder - automatic printing press
Feeding folding machine
Hand feeder - printing press
Notching

GUMMED LABELS

Eyelet machine operator
Feeder - glueing machine
Perforating machine operator (labels)
Press feeding (a flat printing press)
Stapling sheets
Stitcher (wire stitches tags and labels)

LOOSE LEAF AND BLANK BOOK

Air brush spray
Counter sinking
Crimping
Feeding press - rotary
Folding machine operator
Index-cutting machine
Machine stitching
Notching
Numbering machine
Paging
Rounding rings (press operation)
Sewing bindings

PAPER BAG

Automatic printing press tenders
Bag machine tender
Folding machine operation (moth proof bag)
Stapling handles (shopping bag)
Top-hook machine (moth proof bag)
Tuber machine tender

PHOTO MOUNT

Conveyor assembly
Corner cut
Deckling machine operator
Die stamping
Feeder - platen printing press; Hot Die printing press

TAG

Corner staying
Die-cutting machine tender
Pin ticket machine tender
Press feeder
Stapling machine
Stitching (machine operation)
Stringing machine tender

TRANSPARENT MATERIALS CONVERTERS

Bag machine tender or take-off

WAX PAPER

Feeder - flat bed printing press;
platen printing press
Metal-edging machine operator
Forming machine tender
Staying machine
Tender - sheeting machine

PAPERBOARD

Cutter girls
platers

PAPER STATIONERY & TABLET

Stapling and staying
Punching and drilling
Cornering and scoring
Plating
Box machine operating

Women in Paper Mills

Transactions, 31st National Safetly Council. 1942 - P 537

The paper industry is using women as locomotive crane operators in the "hot pond of wood rooms"; in the sulphite mill on the flat screens; as electric truck or tractor drivers; on the paper machines as 4th hands; in testing departments as pulp testers and paper testers; in the finishing room in bundling and packaging; as trimmer operators; super-calender operators, and mill cutter operators, as reminder operators, etc.

HD 7260 N 4, 1942 - Vol I.

Women in Converting Paper Industry - P 519 - 525

"In the job of operating a spot-shutter 90% of the job consists of controlling the accuracy of the cut-off. There is no question about a woman's ability to handle this. However, it is necessary that men shift up the rolls, haul the finished paper away from the machine and do any other heavy work involved in the operation" On that basis, where 3 men formerly operated 3 machines, it will be necessary to have 3 women and 1 man on the same job.

On the coast, women are used quite extensively in the furnace, machine shop operations and so on. "You cannot expect to have a woman do a testing job". In one plant 4 women replaced 4 men in the laboratory and do an excellent job. They use women in the finder room - not swinging out bales "Any job that does not require physical effort of more than 25 lbs. we are letting women do."
In one plant a woman is tractor operator - the only woman in that department.

Woman Power in Pulp & Paper Mills
Paper Mill News Apr 24, 1943 - P26.

The Champion Paper & Fibre Co., Hamilton O. have 185 women on salary payroll and 730 on mill payroll. The following is list of departments with job classifications on which women are now working:
Calenders - helpers. Rewinders, helpers & runners. Cutters - crane operators, cutter operators. Finishing - roll wrappers, sealers, skid tackle helpers, stockhandlers, conveyor trimmer helpers, conveyor loaders, conveyor loader helpers, counters, stencil girls, label girls. Shipping - clerks, gas jitney operators. Box shop - nailers & offbearers. Color room - clerks, recopiers. Roll storage - clerks, crane operators. Machine shop - clerk, plate platers, plate polishers. Electric - clerks, meter checkers. Machine room - helper. Wet end control - wet end testers. Oil room - kettle helpers, washer helpers. Semi-coat - coater tender. Pipe shop - clerk. Mill yard - clerk, oilers. Stock chipping - clerk. Store room - clerk. Finishing - helpers. Conditioner - operators. Sorters, count & pile sorter, fan & count. Scales - scale clerk. Inspection - testers. Storeroom - helpers, chemists, inventory control clerks. Office - clerks, timekeepers, secretaries, stenographers, typists, etc.: Sample - sample girl. Sanitary - janitress. Cafeteria - cook, counter girl, dishwasher, cashier. Print shop - clerk.

Pictures show women
1. testing green liquor from sulphite digester. Also checks digester cooking, line samples, etc.

2 Operating Oliver in paper mill.

3 Removing metal shafts from roller stands and placing them in paper rolls. (2 women lifting one shaft.

4 Tending chip belt conveyor

5 Assistant operator on super-calendus (reaching about 2-3 feet above her head)

6 Operating pneumatic crane on coating mill cutter.

7 Gas fitting operator in shipping department

8. Cell repair and relief attendant operator in Electrolytic Bleach plant.

The Inland Printer

Kan Women Operators Jan. 1943 P65

Recent Kansas has lost 23 newspapers since ending Oct 3, 1942 on account of lack of linotype operators. The Kan. Press Assn. in cooperation with Kan State Teachers Col. and Kan. State Board for Voc. Ed. has arranged a plan to train women linotype operators. Training for 8 weeks is $10 paid by newspaper ending candidate.

Texas Printer Report success with women workers apr. 1943 P23

Ranlo, Kerrville, Texas, has been hiring women & training them on job. Most of women on night shift. Employ all skills. A woman plate maker is excellent; she follows plate through etc. Lays up and makes up the positive plate & right. One girl makes a small job press work of fabric - 3c. on impression on hair. Others operate presses (letterpress) some hand feed, some hand feed, doing own make-ready & all other work. Others simply operate presses on dry other work assigned. Women operate some color presses. Men operate larger presses sometimes women helpers. Women are other than men on the Colleator. In medium one man sets feeding machine while girls stack and operate automatic folding machine. All cards - no punch board work finishing done by women. They are decided better at sewing machine than men. Women are paid on same basis as men.

A company in Ohio. In most cases women are performing the duties of the job as well as the men. Contrary to the original belief of an increased accident frequency, they are ardent supporters to the Safety Program.

The greatest difficulty seems to be in complying with State laws as to hours of work, etc. The women wish to work the same hours as the men, they do not want any distinction between male and female in any respect.

At present we have 185 on the salaty payroll, and 730 on the mill payroll, giving a total of 915 throughout. Below is a list of departments with job classifications on which women are now working:

CALENDERS - helpers
REWINDERS - helpers and runners
CUTTERS - crane operators, cutter operators
FINISHING - roll wrappers, sealers, skid sealer helpers, broke haulers, trimmer helpers, conveyor loaders, conveyor loader helpers, counters, stencil girls, label girls.
SHIPPING - clerk, gas jitney operators
BOX SHOP - nailer and offbearers
COLOR ROOM - clerk, rice cookers
Roll Storage - clerk, crane operators
MACHINE SHOP - clerk, blade platers, blade polishers
ELECTRIC - clerk, meter checkers
MACHINE ROOM - helpers
WET END CONTROL - wet end testers
OLD PAPER SYSTEM - kettle helpers, washer helpes
SEMI-COAT - coater tester
PIPE SHOP - clerk
MILLWRIGHT - clerk, oilers
STOCK DIGGING - clerk
STORE ROOM - clerk
EMBOSSING - helpers
CONDITIONER - operators
SORTING - count and piler, sorters, fan and fount
SCALES - scale clerk
INSPECTION - testers
LABORATORY - helpers, chemists, inventory control, clerks
OFFICE - clerks, timekeepers, secretaries, stenographers, typists, etc.
SAMPLE - sample girls
SANITATION - janitress
CAFETERIA - cook, counter girl, dishwasher, cashier
PRINT SHOP - clerks

WOMEN IN PAPER & PULP INDUSTRY

WOMEN'S BUREAU
U. S. DEPARTMENT OF LABOR
Washington, D. C.

On the West Coast:

"More women every day up and down the coast , about 45 now at a plant in Washington. 3,500 of both sexes on the payroll - some women on the green chain.

A second plant in Washington are using women in the screen room, warehouse, laboratory and wood rooms. In many jobs in paper and pulp mills, skill is a prime criterion in selection; and there is a minimum of heavy work. For this reason roll call on women is increasing rapidly.

At a third plant, women have always been used in the converting plant, but they are newly added in the news-print mills. These women are wives and daughter os men already with the company whose policy is to employ their own local residents first. With regard to rates of pay, the starting rate (WLB 50¢ and hour) applies to women who are being taught a job. As soon as they have fully learned they receive equal pay with men on the job rate. The first woman hired was as a pulp tester. Since then women have been added in the beater room, sulphite plant, finishing room and pulp testing departments.

A fourth plant, Oregon is using women for the first time, 4 were put to work February 1, and a week later 12 were added. The jobs were: ream wrapping, sealing, and small packaging of paper.

A fifth plant, Oregon, enlisted women from another mill town but these women were not withdrawn from th ir own town plant, they were recruited elsewhere."

NOTE: The following is a digest of an article by the Assistant Personnel Supervisor of a Washington plant:

"We have about 500 women employed in our plant/ We find that the women who seek employment at our plant fall, roughly, into four different classifications.

1. The drifter who follows the flag, here today and gone tomorrow.
2. The woman with a husband in service.
3. The woman coming from another state with a husband, perhaps over draft age, seeking work in a vital industry.
4. The women who want to help in the war effort.

Added to this are those women who are wives, mothers and sisters of men who have left our plant in the draft.

We try to keep a record of every man who goes into the service and what his wife is doing --- whether she is working for us or elsewhere. I have spent many hours contacting the wives of these men in order to ascertain their situations and make sure every woman is provided for if she is employable, as far as a job is concerned.

* * * * * * * * * *

We must recognize the emotional strain under which these women start to work. It is a place where job instructor training is not only valuable, but essential in the effort to help these adjust themselves as rapidly as possible before they become discouraged and quit. It is a situation in which just plain kindness must have a part.

* * * * * * * **

In order to release as many men as possible for directwar work in our plant and elsewhere, and in order to replace men who have gone into the service, we have had our

jobs surveyed and have made every effort to place women on any job which is suitable for them. We have women operating machines, women as sulphite testers and beater testers, women on cleanup jobs. We even have a girl with one arm operating the elevator at the dock.

* * * * * * * *

Many of these women have children and no one to care for them. Realizing this situation the service clubs in our town sponsored the establishment of a day nursery. Our corporation pays the rent and furnished the equipment. We are told this is the first nursery in the State in actual operation under the Lanham Act, passed by Congress to deal particularly with the problem in war industry areas and which provides funds for attendant's salaries.

Then there the older women who come seeking work because they have sons or relatives in the service, and again we have tried to cooperate by raising the age limit for hiring to the highest age feasible.

****

There are three things we must do:

1. Improve our own moral and spiritual fiber.
2. Build character, which is simply a continuat on of the first, and,
3. Aim for spiritual security . . . . .Spiritual deficiencies are the real bottlenecks in our nation today.(Note: Check up on religious affiliations of mill people and meet local Padres.)

Another plant in Washington: Is doing a thorough-going job of putting women in nearly every part of the mill in order to release more men for the armed services or for jobs only men could do. The program contemplates putting women in all kinds of jobs where experience is not necessary or important.

In the first week of March there were 52 women doing various jobs and more were being added continually to the rolls. Last October there were only six women in mill jobs and these were all in the finishing room.

Under the direction of the management, the Personnel Manager was pursuing a program to put in more and more women in various departments. Arrangements were made with union officials to employ women in the acid towers and elsewhere in the sulphite mill.

A dozen women were working in the breakdown mill. They were spudding, scaling, operating transfer buttons and off-bearing from the edger. It was contemplated that women would be working also on the Stetson-Ross barker and the Stetson-Toss brouter.

About 225 men have left the mill to go into the armed services. Of this number 75 were given certificates which guaranteed them jobs on their return. These certificates go only to the men who were continuously employed in the mill since May 1940. A number of men who worked in the other parts of the plant have gone into the machine shop where they have played an important part in the special war work being done there under the direction of the resident engineer and the master mechanic.

WOMEN IN PULP AND PAPER INDUSTRY

WOMEN'S BUREAU
U. S. DEPARTMENT OF LABOR
Washington, D. C.

In the Southern Mills

"Southern mills hire women. In areas of labor shortage in the South, women are doing mill work that operating men would not have considered possible relatively a few months back.

One mill in Georgia is substituting girls and older women for men. Their laboratories are entirely operated by women as are all electric pulp trucks in the warehouse. In operating the departments these jobs were given to women around the clock; operating water plant, first helpers and testers in the bleach plant, lime kiln operators, caustic testers, screen room operators and helpers, digester helpers blowing digesters. As war's demands on labor increase it is expected that women will take over more jobs at the plant.

A second plant as of February 1, 30 women at pulp mill #1 where the total crew is 250. They were employed in the screen room, chip room, laboratory, finishing room and other departments."

A plant in Vermont - This firm has used women for the so-called heavy jobs. They have made a special effort to get the right type of women for the particular jobs.

A visit to this firm might give us the following information: Age, weight, height, general strength, previous experience if any, and national type (Polish, French Canadian, Latvian, etc.) This firm has made use of man and wife combinations on the same job ans has found it successful.

A plant in Wisconsin - This firm and others has followed the West Coast in setting up their women's divisions. It would be useful to know just how far they have gone in substituting men and women in the jobs which are too hard for a woman alone, and what methods they have used to help the woman. Has mechanical lifting come into this, or has one man done the lifting on two or three jobs otherwise handled by women?

WOMEN'S BUREAU
U. S. DEPARTMENT OF LABOR
Washington, D. C.

WOMEN IN PAPER AND PULP INDUSTRY

A plant in Pennsylvania has been progressively fitting women in wherever they were needed. Their turn-over of help has not been as large as that of another plant, but girls are used in sorting, piling and fanning.

Rotary Cutters:

Girls are used on these machines. Training is given at the machine under the supervision of the Women's Coordinator, a woman of about 40, who has been with the firm a long time and has made an excellent record in several different jobs. She works in a very informal manner, speaking for the girls' group to management, planning transportation for the different shifts, and working out women's rest rooms.

Rate of Pay:

The President feels that the woman who does a man's job as well as he does deserves equal pay. She is started at a lower rate for a short time, the rate depending on the job, and then, when skilled enough to operate without supervision, equal pay.

Automatic Layboys are tended by women.
Finishing room is staffed by women with man foreman.

Type of Workers:

These girls seemed to divide into two groups, those in the finishing room were the "prep school " type, young, snappy, dressed in sweaters and skirts while the girls on the rotary cutters were older, probably between 30 and 40, and showed quite a bit of mechanical knowledge.

Oilers:

Girls are used now as oilers on the fronts of machines and later will be on the back. This management will shift men as needed and put women where practical.

Women's Accomodations:

Special washrooms with lockers and coat racks were installed for the first women workers, and showers are in process as this mill is very hot in summer and, with more women taking over the dirty jobs, the President regards them as a necessity.

Uniforms:

No uniforms were worn by women. They have been suggested and voted down.

Housing:

There is no housing problem to speak of as most of the girls live with their families locally.

Foreman's Report:

The foreman felt that women did not need any more care in handling than men, but rather a different sort. They like immediate praise for work well done, they are not especially interested in union benifits vs. what the dues money will buy. They are very war-conscious, and keenly interested in the quantity of work they do, being much more exacting as to details. The amount of damaged paper has been notably cut down with women workers. Usually, they take the short range view.

Esprit de Corps:

Most of the people in this mill had always lived in the town, they knew each other's ways and got along well together. They worked out their own transportation plan and on the night shift the men take care to see that those women not using trains get rides. The town station is right at the plant.

Unions:

Neither A.F. of L. or C.I.O. are in this plant. A local independent union is in this mill and the other plant also.

Negroes: (The foreman's report)

On noticing several young male negroes working around, I asked the President, who was my guide, if they employed many negroes. He said that they were trying to but the turnover was very high and that the type they were able to get were untrained, not only in the paper trade, but in any sort of good work habits. The grade of man was being improved by a gradual weeding our process and he was hopeful about negroes.

Young school boys on four hour shift were also considered here.

The president of this plant and the president of the other plant are very close to each other and exchange ideas several times a week.

OCCUPATIONS

ORDNANCE + EXPLOSIVES -1943

U. S. Department of Labor
WOMEN'S BUREAU
Washington

(Source: New York Times - July 20. 1943)

AKRON, Ohio, July 19--For the first time in the history of the company, women are on the tire machines of the B. F. Goodrich Company plant here. The feminine force, numbering 100, began training a month ago and their work has proved entirely satisfactory, company officials said today.

The heaviest part of the women's work is removing the tire from the drum on which it is built and tossing it up on the hook of the conveyor system that carries it away for curing and vulcanization.

The women tire builders are paid the same rate as men get for the same jobs.

March 6, 1943

Major L. K. Kallmeyer
Commanding Officer
Trojan Powder Company
Plum Brook Ordnance Works
Sandusky, Ohio

My dear Major Kallmeyer:

I enclose a copy of our report on possibilities of Women's employment in TNT manufacture. I shall be very glad to have your comments before the material is put to further use. Perhaps you will feel the list on pages 2 and 3 very conservative. Some ~~provision~~ reviews will be made of the description of processes on the basis of Army Ordnance Technical Manual No. 9 - 2900, Military Explosives. A copy is sent to Mr. Nellis, Works Manager, in the same mail.

Sincerely yours,

Margaret T. Mettert,
Associate Industrial Economist

Enclosure
MTM:ml

March 6, 1943

Mr. C. L. Shartle, Chief
Occupational Analyses Section
Bureau of Employment Security
Social Security Bureau
404 Rochambeau Building
Washington, D. C.

Dear Mr. Shartle:

I enclose a copy of our report on possibilities of women's employment in TNT manufacture.

Sincerely yours,

Margaret T. Mettert,
Associate Industrial Economist

Enclosure
MTM:ml

TNT Study

March 6, 1943

Mr. E. L. Nellis, Works Manager
Trojan Powder Company
Plum Brook Ordnance Works
Sandusky, Ohio

Dear Mr. Nellis:

I enclose a copy of our report on possibilities of women's employment in TNT manufacture. I shall be very glad to have your comments before the material is put to further use. Perhaps you will feel the list on pages 2 and 3 very conservative. Some ~~prev~~ provision will be made of the description of processes on the basis of Army Ordnance Technical Manual No. 9 - 2900, Military Explosives. A copy is sent to Major Kallmeyer in the same mail.

Sincerely yours,

Margaret T. Mettert,
Associate Industrial Economist

Enclosure
MTM:ml

TNT Study

WOMEN MAKING EXPLOSIVES IN WORLD WAR II

1. Women's Employment in Manufacture of TNT
   (A well-rounded summary of wartime conditions, 1943. Would be useful in a small bulletin.)
   - Description of Processes
   - Occupations Suitable for Women
   - Hazards of TNT Manufacture, Preventive Methods

2. Employment of Women in Ordnance in World War II
   (Wartime and early postwar employment, from War Production Board Form 732.)
   - Brief Paragraph (Ordnance plants)
   - Fuller Data (Ammunition plants)
   - Table Showing Details

3. The Exposure of Women to Industrial Health Hazards in War Plants in A Large Industrial State, 1942
   (The occupational hazards section of a W.B.wartime State industrial study, Bul. 197.)
   - Effects of War Conditions on Industrial Health
   - Potential Exposure of Women
   - Systemic Poisons
   - Dermatitis Producers
   - Respiratory Infections
   - Other Exposures

4. Women in Manufacture of Explosives
   (Brief pages planned for popular leaflet, 1941.)
   - Processes Employing Women
   - Hazards
   - Basic Standards for Safe Handling

MEP:tvw
11-1-51

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

WOMEN'S EMPLOYMENT IN THE MANUFACTURE OF TRINITROTOLUENE (TNT)

January 1943
(Recopied October 1951)

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WOMEN'S EMPLOYMENT IN THE MANUFACTURE OF TRINITROTOLUENE (TNT)

Until recently women have been employed in plants manufacturing TNT only in office work in the main administrative area of the plant or as nurses and medical technicians in plant hospitals. Their employment has already expanded along related lines of work. Girls are replacing young men as escorts to accompany visitors from one administrative building to another. Women are now doing clerical and semi-clerical work in receiving and stores departments located in the manufacturing area but separate from any buildings where acids or TNT are actually handled.

In addition to these employees of the company, the Ordnance Department employs inspectors to guarantee a product of specified quality. Women are now at work as inspectors, both in the nail house where inspection of the TNT is made and in the box faxtory where wooden boxes are cut out and assembled.

Conditions of manpower shortage in areas where TNT manufacturing plants are located necessitate careful consideration of the possibility of further placement of women. Plants report turnover, largely due to Selective Service demands, of 10 to 12 percent a month. Substitution of women who can be drawn from the locality of the plants would also relieve increasingly difficult housing situations. Family dwellings are more scarce than other living facilities.

Study was made of processes and occupations to determine whether women could perform the various duties, the extent of training that would be required, changes in methods, tools or working conditions that would make the employment of women more efficient, and the possibility of harmful effect on the health of the women in the various occupations.

TNT

SUMMARY OF OCCUPATIONS WHERE WOMEN'S EMPLOYMENT CAN BE EXPANDED

Auxiliary Departments

I - Service Department

1. Clerical workers in all divisions

2. Protection division employees
   (1) Issuing passes to visitors and checking identification
   (2) Guards manning fence watchtowers
   (3) Chauffeurs of patrol cars

3. Safety division employees
   Inspectors - about one-half of all inspectors could be women

4. Medical division

   (1) Physicians
   (2) Janitor service

5. Grounds division
   Operation of power driven farm and lawn machinery
   used for maintaining grounds

6. Yardmaster's division

   (1) Scheduling of loading and unloading transportation equipment
   (2) Chauffeurs
   (3) Truck drivers - where loading and unloading is light

7. Power division

   (1) Oilers
   (2) Firemen (automatic stokers)
   (3) Pump operators
   (4) Chlorinator control operators
   (5) Electric switchboard operator's helper

II - Maintenance Department

1. Helpers to skilled mechanics

2. Automotive mechanics

3. Machine shop work such as:

   (1) Welding
   (2) Tool crib attendant
   (3) Equipment insulators
   (4) Instrument and scale mechanics
   (5) Oilers

III - Laundry

Operatives throughout laundry

IV - Laboratory work

1. Laboratory testing

2. Bottle washing

V - Box Factory

1. Cutting boards to size

2. Printing machine operator

3. Box assembly machine operator

Production Departments

I - TNT Area

1. Weighing and packing operators

2. Nail house operators

(1) Glueing paper flaps
(2) Nailing covers - operation of nailing lids by machine
(3) Fastening metal strips around boxes

II - Acid Area

Converter operator and helper

Compressor operator and helper

Nitric acid concentration operator and helper

Sellite house operator

PART I - DESCRIPTION OF PRODUCTIVE PROCESSES

The productive processes involved in TNT manufacture have two main divisions: First, the making of strong nitric acid from anhydrous ammonia acted upon by sulphuric acid; second, the nitrating of toluene with the mixed acid to make TNT. The first process is carried on in the Acid Area, the latter in the TNT area. One plant will have several acid lines in the area and possibly six times as many TNT lines in the TNT area.

Acid Area

The main purpose of this area is to produce strong nitric acid. The operations are continuous from the unloading of the anhydrous ammonia as it is received in tank cars to the final mixing of the strong nitric acid with sulphuric acid for shipment to the TNT area. As anhydrous ammonia is received it is unloaded to storage tanks from which it can be piped as needed to the Oxidation House.

In the Oxidation House the ammonia vapors are mixed with preheated air and forced through a platinum screen which acts as a catalyst. Vapors so produced then go through absorption towers and condensers forming a weak nitric acid - about 60 percent.

From the Oxidation House the weak acid is piped to the Mixing Plant (weak) where sulphuric acid of specified weight is added and the mixture pumped to the Tower - Cascade House.

In the Tower-Cascade House the mixed acid is heated in a system of boilers. The nitric acid vaporizes at a lower temperature than the sulphuric. The vapors flow through an absorption tower and into a condenser. The sulphuric acid, which acts as a catalyst and dehydrating agent, is sent to the Drum Concentration House and the strong nitric acid to the Mixing Plant.

The strong nitric acid is mixed with sulphuric acid in the Mixing Plant and then loaded into tank cars to go to the TNT area.

The sulphuric acid from the Tower-Cascade House and waste sulphuric acid from the Recovery House on the TNT lines are received in the Drum Concentration House to be strengthened for re-use. The waste acid is run into an oil-fired boiler and part of the water boiled out. The exhaust vapors leaving the boiler go through an electric precipitator and any acid in the vapors is caught.

TNT Area

Production of TNT is accomplished by nitrating toluene with a mixture of nitric acid and sulphuric acid. Production is continuous as in the acid area. Its manufacture takes place in four operations:

In the first, toluene is nitrated by means of a mixture of nitric and sulphuric acid at a temperature of 35 - 40°C. The mono-nitro-toluene resulting is nitrated again yielding dinitrotoluene. A third nitration yields a mixture consisting of trinitrotoluene and small amounts of oxidation products. In the final operation the crude TNT is purified by contact with sodium sulphite.

Toluene, purchased already prepared, is pumped from tank cars to storage tanks and drawn off as needed. The first nitration is made in the Mono House. From the Mono House the charge is blown to the Bi-Tri House, while the used acid is sent to the Recovery House.

The final stage of nitration offers most difficulty. Fuming sulphuric acid is added to the bi-oil; then the mixed acid from the Acid Line is started. The temperature is increased gradually to about 180°F. After nitration is completed, the charge is cooled and allowed to settle. The spent acid is drawn off to the Fortifying House; the tri-oil is sent to the Wash House.

The crude trinitrotolune is run into neutralizing tubs when it arrives at the Wash House. The neutral TNT in the form of oil is pelleted by being run into cold water. These pellets are melted and run into crystallizing kettles where the TNT is deposited on the sides in the form of crystals.

When purification and crystallization are complete the TNT is deposited through a chute into paper lined wood boxes. From there the boxes are sent by conveyor to the Nail House where they are weighed, sealed and loaded on trucks.

In the Recovery House spent acid is run through a system of towers to separate the nitric acid from the sulphuric. This nitric acid is used for fortifying mixed acids. Waste sulphuric acid is pumped to the Drum Concentrator House on the Acid Line to be strengthened.

The process of fortifying the waste acid from one nitration with an additional amount of nitric acid so that it can be used for another nitration is performed in the Fortifying House. The mixed acid received from the Acid Line is first used in the trinitration process. It is fortified and reused in the bi-nitration,refortified and used in the mononitration. From here it goes to the Recovery House.

DESCRIPTION OF AUXILIARY DEPARTMENTS

Administrative

Box Factory

Wooden boxes for packing TNT are manufactured in this factory.

Laboratory

Chemical control tests and necessary chemical research is the function of the laboratory division.

Maintenance

The maintenance department takes care of machine, equipment and building maintenance.

Power House

Produces power and heat for the plant.

Protection Department

Provides police and fire protection.

Sellite Plant

Makes solium sulphite used in the purification and crystallization of the TNT after the washing.

Service Department

Under this department is included the Dafety Division, first aid care, Medical Division, the laundry, and janitorial work.

Waste Water Plant

Waste water from the TNT lines is processed to remove and destroy any TNT that might still be present.

Water Plant

Maintaining flow of water for the washing operations in the manufacture of TNT is in charge of this plant.

Direct production - TNT and Acid Areas - requires about half the total employees in a plant manufacturing this explosive. Expansion of women's employment should be considered both in auxiliary departments and in direct production. We discuss first the work of auxiliary divisions as to their suitability for woman employment since it is here that the greatest number of women can be used.

PART II - OCCUPATIONS SUITABLE FOR WOMEN

AUXILIARY DEPARTMENTS

Service Department

The use of women clerical workers can be expanded not only in the Administrative Department but in the Service Divisions and other branches of the plant.

In the Protection Division girls can and no doubt soon will replace many of the men whose duties are principally issuing passes to visitors and watching the long line of fence that surrounds the reservation. A staff of armed men will always be necessary but they can be greatly decreased in number. Over 400 men may be required in the protection division of such a plant. Of this number well over half could be women. Where gates are guarded by two policemen, one woman could be employed. Watch towers can be manned by women with male police on call in case of trouble. Patrol cars can be driven by women.

In the Safety Division of the Service Department there is possibility of replacing a few men with women. In addition to the safety engineers whose work is professional and highly technical, inspectors are employed who do not have a technical engineering background. These inspectors must be well versed in productive processes of the plant to do a good job. It is their work to make constant safety inspections. While some are assigned to continuous duty in certain areas most move around from one area to another. Following inspection an intelligent report of conditions and recommendations must be made. A considerable period of training would have to be allowed. With such training about half these inspectors could be women.

The Medical Division has most important functions. It must make a thorough physical examination of each new employee, periodic examinations of every employee exposed to TNT, toluol or other toxic fumes or dusts. In the case of TNT exposure such examinations should be given at least every 2 weeks. It must furnish first aid at stations thoughout the reservation and operate a hospital 24 hours a day and 7 days a week in case of emergency. Such a Division must be adequately staffed with physicians. One physician must be present at the hospital at all times. The present shortage of men physicians necessitates taking women physicians into this field. A considerable proportion of all the first aid attendants can also be women. Most of the janitor and chauffeur service required can be undertaken by women. In this

latter occupation women have proven their ability in the Red Cross Motor Corps.

The grounds division of the Service Department - maintenance of grounds area - presents quite a different picture. Practically all the work requires little skill or training and a very large proportion of the employees could be women. Driving of power operated lawnmowers and other power driven farm and garden machinery are examples of the type of work women could do. No doubt a small proportion of men will always be needed for the heaviest manual labor.

The employment of women could be expanded in the Yardmaster's Division. Similar work is handled by women in various transportation industries both in this country and in England. In general, the Yardmaster's job involves the scheduling of loading and unloading the routing of transportation equipment including a taxi service on the reservation and from the plant to town. Women could be used as chauffeurs and truck drivers (where loading and unloading of heavy material is not involved). They can also be employed as weigh masters if State licensing regulations can be met by women applicants. The job of greatest difficulty and danger in this division is driving large trailer trucks loaded with boxes of TNT. These boxes weigh 54 lbs. Any loading or unloading would be too heavy for the average woman.The handling of large trailer trucks with such a cargo does require careful training.

Employment in the Power Division could be opened to women since much of the operation is automatic and does not require great strength. Jobs that women could do without lengthy training include oilers, firemen, pump operators and chlorinator control operators. Operation of the electric switchboard is highly responsible work and training and experience would be a necessity. A woman could be employed as assistant to the chief operator.

Maintenance Department

Many of the maintenance jobs require experience and a high degree of skill. Such are the electricians, carpenters, millwrights, lead burners and pipefitters.

These skilled men would be very hard to replace. However, there are categories in which women could be employed. Some of these would be helpers to the skilled mechanics. Women automotive mechanics are being trained by the Red Cross Motor Corps and no doubt women could be trained to maintain and repair trucks, tractors and station wagons used on a TNT reservation.

Much of the maintenance work is done in the machine shop. A difficulty in training women for the machine shop work is that so large a part of it is repair work to fill some specific need. Each job may be different from the last and machines may need to be re-set for almost every job. Without considerable training and experience women could not work independently in these jobs. Women could be employed in the machine shop to act as tool crib attendants.

A few could be used in welding - one-third to one-fifth of the total welders , though here again, the welders must be experienced in all types of welding - arc, acetylene, bar, spot and butt. Some of the welding is done on stainless steel, requiring special skill and experience and presenting special hazards from the point of view of fumes. Some of the material to be welded is contaminated with acids and great care must be taken in handling and welding these metals.

A few other maintenance jobs are possibilities for women. These include equipment insulators, instrument and scale mechanics and oilers.

Maintenance work may be required in any part of the reservation, so these employees may be exposed to any of the hazards of the various occupations. That they need careful safety training in all the hazards of the industry is indicated by the fact that in one company maintenance men ranked second only to workers in the TNT areas in number of cases of TNT dermatitis. Maintenance men ranked second only to one TNT area in number of acid burn cases, and second again to TNT area workers in acid burns of the eyes.

LAUNDRY

A laundry must be maintained to provide the clean uniforms and towels that are furnished to production employees daily. Women could do practically all the work of laundry operation as they do in outside laundries. Consideration should be given to the fact that there is some exposure to TNT dust that may cling to garments or towels. These employees should be under constant medical supervision for this reason.

LABORATORY WORK

Laboratory testing - making routine tests under supervision - and bottle washing in laboratories can well be done by women in TNT manufacture as it is in many other industries.

BOX FACTORY

Light wooden boxes of the air tight lock corner type are manufactured for the finished product. Many of the box factory jobs could be performed by women, cutting the pieces to size, printing by machine, operating box assembly machinery. These jobs are particularly adaptable to the employment of women because the factory is a separate unit not exposed to the peculiar dangers incident to work with TNT and Acids.

The Ordnance Department now has women inspectors to discard finished boxes having slivers, splits, knot holes or other such imperfections. Rest room facilities have been installed for these inspectors, facilitating the placement of women in other box factory jobs.

PRODUCTION AREAS

TNT AREA

Solely from the point of view of the physical effort required many of the jobs in the TNT Area and in the Acid Area could be handled by women. Such jobs include (1) operators and helpers in the Recovery House. Here the work requires regulation of valves to control preheating of the acid, taking observations and

recording necessary data. The operator may be called upon to make minor repairs such as the replacement of glass connecting tubes.

(2) Operators and helpers in the monohouse. The operator weighs the amounts of toluene and mixed acid to be used and controls the introduction of these materials into the nitrator. Temperature and speed of agitation must be carefully controlled during the nitration.

(3) Operators and helpers in the Bi-tri House. Here again careful control of temperature and speed of reaction is of utmost importance.

In general operators in each of these units must watch gauges and valves to control temperature and flow of materials and must watch the operations carefully to be sure nitration is progressing normally. While the various operations are carried on in small individual houses there is close interrelation of their work. A system of signal lights indicates when the next house in line is ready for the batch.

The jobs listed in these houses on the TNT line demand individuals at least 5 feet 6 inches tall to permit easy access to gauges and easy manipulation of valves. This requirement would limit the number of women available for the work. Of even greater importance to the operation of these houses is a worker with an even stable temperament capable of acting quickly and wisely in an emergency. There are notable instances of quick action upon the part of women as well as men in emergencies but there is no mass data as to whether the propotion of women is equal to the proportion of men who may do so.

The TNT lines present special health and safety problems that must be taken into condideration if the employment of women is essential. These problems have been considered in some detail on pages 13 and 17.

Other occupations on the TNT lines seem more feasible for women. Operation in fortifying houses is one of these. It is, however, extremely hazardous from the point of view of explosions and exposure to nitrous oxide fumes. The operator is responsible for "butting up" spent acids and delivering them through the blow

case to the proper nitrating house.

Washing, melting, drying, flaking, weighing and packing of TNT requires 4 or 5 workers per shift in each wash house. The work carries with it less danger of explosion than other units on the TNT line and is considered possible for women from the point of view of physical strength requirements. One man would be needed to carry full boxes of TNT weighing 54 lbs. from conveyor to elevator occasionally. Only boxes not meeting specifications are returned in this way. The Wash House is a principal source of danger for TNT poisoning and dermatitis. The possibility of special susceptibility on the part of women to TNT fumes or dust is a principal deterrent to their employment in Wash House jobs. These occupations have had the highest rate of dermatitis and poisoning cases of any on the reservation.

Finally, the boxes of TNT go by conveyor to the nail house, the last building on each TNT line. The work of glueing down paper flaps, nailing lids by machine, and fastening metal strips around boxes is well within the physical capacity of women. Since the boxes move from one operation to another by conveyor and thus require no carrying the work could be done by women. These operations entail a slight exposure to TNT. Women are at work in nail houses as inspectors of the final product. They are employees of the Ordnance Department. Provision of change house facilities for these women has been made and should facilitate the employment of women for other jobs in the area.

Acid Area

In many ways work in the Acid Area would be more suitable for women than work in the TNT areas. Most of the work is light. Most of it requires training of only a month or six weeks to six months if applicants have high school or college backgrounds. As in many of the jobs on the TNT line, an operator may have to act very quickly and with presence of mind in emergencies to prevent serious accidents.

Loading and unloading of tank cars in the area calls for outside work in all kinds of weather, is heavy and poorly adapted to the physical strength of women. The cars are unloaded or loaded by means of pipes inserted into the tops of cars and operation of the necessary valves for siphoning out the liquid or pouring it in. Mixed acid operation is another job requiring climbing ladders and stairways to the top of high tanks outside in all kinds of weather.

The storage tanks must be heated to force the ammonia to the ammonia oxidation house. In this house converter operators regulate the flow of ammonia, air, steam, and water, control the temperatures and make test samples. The various gauges showing pressures and temperatures must be carefully read and recorded periodically. Compressor operators start and stop air compression in accordance with signals from the converter operator and check pressure. Women could be employed in these jobs starting, of course, as helpers to the experienced operators.

In the nitric acid concentration house fewer operators and helpers are required - about 2 of each per shift - and their work requires longer periods of training. A helper can be trained satisfactorily in about 3 months, an operator in about 6 months. The latter is responsible for the work involved in the heating by steam of mixed acids to vaporize the nitric acid. Workers control the temperatures and flows and record information. Helpers assist by going over the 5 floors of the building making recordings and adjustments and taking periodic samples from each unit in the building. Helpers take samples to the laboratory and bring back the results. Women could well be employed as helpers in these houses. Similar duties in the sulphuric acid concentration house can also be performed by women.

In the sellite house where manufacture of sodium sulphite is carried on, the situation is different. The less skilled work is heavy labor requiring shoveling wheelbarrows of sulphur and transporting them within the plant. The operator who directs the work of 3 helpers on each shift has the more responsible work and his work is not heavy. The difficulty in employing a woman for the job of sellite

operator lies in placing her over male helpers whose experience may give them seniority rights.

There is evidence that the Acid Areas are less hazardous than the TNT Areas. They have good safety records in comparison to either TNT or maintenance departments. Even danger of acid burns is greater in the early stages of nitration than in the manufacture of the acids. Fumes from sulphuric acid may be annoying and uncomfortable if atmospheric conditions prevent rapid dispersion, but they are not dangerous to health.

PART III - HAZARDS OF TNT MANUFACTURE AND THE PREVENTIVE METHODS IN USE

Recommendations for Changes in Case of Employment of Women in Production Work in TNT Manufacture

Provision of adequate medical supervision including biweekly periodic check of employees exposed to TNT should be instituted before women are employed. Appointment of women medical officers to make adequate supervision possible should be seriously considered.

Provision for nutritious hot lunch should be made.

Some special instruction should be given women in the covering of their hair to prevent carrying toxic materials home on it. Other special adaptation of protective clothing may be necessary for women.

No employee should be permitted to leave the premises without taking a complete shower bath to remove all traces of TNT from the body. Special solutions should be supplied to aid in removal. A 5 to 10 percent sodium sulphite solution is usually recommended, though acetone or potassium sulphite is sometimes substituted. In one plant sulphonated castor oil is considered preferable.

Statistical information on injuries to women with information about man hours of exposure should be kept separately from that of men to indicate any special dangers involving women.

Except for the possibility indicated by British and American authorities that women are more susceptible than men to TNT and toluol poisoning other hazards of employment would be the same for women as men.

TNT Dust

Employees in occupations in the wash house, flaking operations, boxing and weighing house and nail house to some extent the laundry and TNT laboratory are exposed to TNT dusts or vapors. The occupations with such explosure include:

Supervisors

TNT wash house operator

TNT wash house operator helper

Melt, drier, and flaker operator

Pack and weigh operator

Final pack operator

Final pack operator helper

Bottle washer in chemical laboratory

Laundry operator

There are indications that the greatest danger of TNT poisoning and TNT dermatitis are under conditions of expansion and probably to new workers. Both dermatitis and toxic TNT occur most frequently in TNT areas.

A fatal case reported by one plant, proably due to TNT jaundice, has occurred in the 9 months of that plant's operation. The young man was a wash house operator who had worked for 3 months at that occupation before his death. He had a history of previous gastric trouble but the indications were that his death was due to TNT exposure.

British authorities reported more than twice as many TNT jaundice cases and 3 times as many deaths to women than men. Of 41 cases of toxic jaundice in 1941, 12 were males and 29 were females. Of these, 3 cases were fatal among males

and 9 among females. The report concludes that there is reason to believe that women have an excess susceptibility to TNT poisoning.

Considerable contact with TNT and DNT is occasioned by recovering these materials from the catch boxes after the washing process, and this process is considered one where exposure to TNT dust is most likely to occur. Although the work itself might be done by women in the wash house, in boxing and flaking processes, because of the danger of exposure to dust or vapor women should only be taken as a last resort. The possible excessive susceptibility of women should be considered. Women employed by the Ordnance Department as inspectors in Nail Houses have some exposure to TNT.

In addition to dermatitis and toxic jaundice, TNT exposure may cause toxic gastritis. Vomiting and loss of appetite are symptoms. TNT workers may also suffer from anemia and cyanosis. The cyanosis is evident, according to investigators, where there is slight exposure. The presence of cyanosis indicates that workers are receiving too much exposure and either should be removed from the work or their work conditions improved. Blood counts frequently indicate reduction in red cells and hemoglobin soon after exposure. Complete blood counts should eliminate applicants with any tendency to anemia and recheck in the periodic examination will indicate need for transferring exposed workers.

Prevention of poisoning by TNT takes several forms. Exhausting of dusts and vapor is one. TNT in bulk form will volatilize to a slight extent even at normal temperatures. TNT dusts and vapors are heavier than air and must be exhausted by down draft ventilation, clean air being brought in at the top of the room. The exhaust should be drawn through water screens in which the TNT will collect. Proper arrangement of the operations in relation to exhausts and outside ventilation are very important. Respirators are not considered advisable for continual use but are kept in convenient locations for use in case of unusual exposure. The dust collects at the edge of the respirator, and the friction of the

respirator on the face may cause dermatitis.

Protective clothing should be issued to all workers exposed to TNT dust or vapor, and are laundered daily. Gloves should not be worn as they, like respirators, have been found to be dust catchers that serve to bring the skin into closer contact with the material. Protective varnishes or creams have been found useful in some plants.

Shower facilities are important in prevention. It is known, however, that the men do not always avail themselves of the opportunity to bathe and rigid regulations to enforce bathing have not always been set up. One company provides sulphonated castor oil in all houses on TNT lines and in change houses instead of soap since it has been found to be a good agent for the removal of TNT from the skin and does not defat the skin as does sodium sulphite. Sodium sulphite, potassium sulphite or acetone are aids in washing in other TNT manufacturing plants.

If women are to be employed in places exposing to TNT dusts, clipping their hair rather short to make possible frequent washing and to prevent carrying dust home in their hair would be necessary.

A good state of nutrition is of first importance in preventing poisoning. The medical director in one plant expressed the opinion that there is no substitute for 3 good meals a day to maintain good nutritional status. Multi-vitamin tablets are recommended for distribution to the men in toxic areas twice a day. Milk has long been furnished to those exposed to TNT. At present the feeling is that there is no specific value derived from the consumption of milk though, of course, the effect on general health is helpful. In this connection the inability of the production workers in many cases to get hot midday meals should be noted. Those in rooming houses must have their lunches put up in restaurants several hours before meal time. It would seem wise to devise some system by which the productive areas could be given a well-balanced, nutritious lunch.

Medical examination is very important in preventing poisoning. The pre-employment examination is complete in all plants and designed to eliminate any with anemic conditions, respiratory infections, heart or vascular diseases, malnutrition, diseases of the liver or gastro-intestinal tract, venereal disease, or those who use alcohol. Periodic examination is made in one plant approximately every 6 weeks, in another every 3 weeks. Most authorities advise weekly or biweekly examination. First aid men may make occasional skin patch tests to indicate sensitivity to TNT.

Careful selection and medical supervision is particularly necessary because some workers will be so susceptible that even the best working conditions do not protect them.

Nitrous Fumes

The fumes of nitrous oxide constitute a very serious health hazard. Exposure causes swelling of the tissues of the lungs varying in seriousness with the extent of gassing and the adequacy of treatment. A serious case occurring in one plant visited shows the need for immediate care. Fortunately this man recovered and is now employed in clerical work where there is no exposure. He was a new worker and, anxious to prevent spoiling the batch he was working on in the mono-house, he remained at his job in the fumes rather than leave to get a respirator. He did not report to the hospital as ordered by the supervisor but went home. When he woke with pain in his chest in the night he dressed and drove himself to the hospital. His case was very serious and recovery slow. Any worker exposed to nitrous fumes should be under medical observation for a period of 12 hours at least and should be carefully watched.

Nitrous fumes may be exhausted from buildings at ground level. A more satisfactory exhaust system would require stainless steel piping to carry the

the fumes up the outside of the buildings so that people outside would have no exposure. Acute poisoning does not occur when exposure is in the open air, according to some authorities.

Rules given to workers require them to leave the danger zone immediately in case of a nitrous fume leak, to report the condition to the supervisor and not to reenter the danger zone without a gas mask.

If the worker has inhaled nitrous fumes to the extent that he has discomfort from pains in throat or chest, continued coughing, weakness, dizziness or nausea, he must be carried out in the fresh air, kept warm with blankets and a first-aid attendant called.

Nitrous fumes are a possible hazard in the mono-house, the bi-tri house, the wash house and the fortifying house.

Toluene Vapors

Toluene vapors are not only highly inflammable but the fumes are toxic. Hose respirators are available for workers in any section where escapement of toluene fumes is a possibility. Exposure to toluene fumes may be suffered by employees in the mon-house, the bi-tri house, to maintenance men in the area and in the unloading of toluene from tank cars, though this last job would be in the open air.

EXPLOSION HAZARDS AND THEIR CONTROL

Methods for the prevention of explosions are said to be highly standardized and similar in various plants. Explosion may result from the process of manufacturing and mixing acids or from the TNT itself.

Protection of employees begins with construction of the plant. Laid out in an area about 20 miles in circumference, individual units are small and the number of employees in any one unit where explosion hazard exists is strictly limited. For example, not more than 4 persons may be in the mono-house, not over 3 in the bi-tri house at any one time. These small units are protected from each

other by high wooden barricades.

Each unit is provided with chutes so that employees may leave their place of work speedily in case there is indication of trouble. These are said to have little more than psychological value.

The bi-tri house is equipped with water tanks so that if there is indication of trouble the batch can be disposed of in the water tank.

Automatic fire extinguishing systems and automatic fire alarms are installed everywhere and inspection is frequent. Electrical equipment, tools, and so forth, are of prescribed non-sparking materials and construction.

Regulations require the wearing of powder shoes, prohibit the wearing of wrist watches around TNT, prohibit any carrying of matches or lighters.

Employees are picked for their temperamental characteristics as well as their good general health to protect against explosion. Ability to act cooly and quickly in emergency is essential to prevent explosion and to prevent spoilage of the batch.

It is also felt important that operators in the TNT area and in some parts of the Acid area be at least 5 ft. 6 in. tall so that levers and valves can easily and quickly be reached in case of emergency. Height regulations would restrict the employment of women. Where explosion hazards are greatest, in the mono-house, bi-tri house, and acid recovery and wash houses, administrative officials agree that women should not be employed.

ACID BURNS AND THEIR PREVENTION

Acid burns are one of the most serious hazards of TNT manufacture. The danger exists principally in the TNT areas, the acid areas and to maintenance men. The largest number of cases reported in one plant occurred in the TNT area most recently opened for operation. Almost as many occurred in one acid area and among maintenance men. The three TNT areas had something less than half of all acid burns, the two acid areas accounted for about one-fourth of all burns.

In addition, acid in the eyes injured 17 TNT workers, 9 maintenance men and 7 acid area employees.

Two very serious acid burns have occurred recently in this plant when acid fumed up in the faces of two men. One wearing safety spectacles had his eyes as well as face seriously burned. The other wearing full safety goggles had his eyes fully protected. Both these cases occurred in the TNT area.

Showers are installed at convenient points wherever acid burns are a hazard so that the employee may immediately enter the shower and wash off the acid. When loading or unloading acid cars and braking acid lines, showers must be kept running. A green light automaticlly indicates that the shower is running.

All workers around acids are provided with woolen suits, plus, in the winter, long woolen underwear. Cotton or other materi l would disintegrate completely on contact with the acid. Rubber gloves, boots, coats and helmets are conveniently available for all workers who may be required to enter a place where acid burns are particularly likely to occur. These garments, for example, must be worn, on entering the tanks in the mono-house where pressure in the glass tubes might cause breakage. Safety goggles are available but not required since they steam over and are difficult to work with.

OTHER INJURY PROBLEMS

Some outside work such as tank car unloader and mixed acid operator, requires exposure to the sometimes severe winter weather, climbing ladders and stairways that may be icy. Women could do much of this work if they are chosen for their good general health and resistance to respiratory infections.

Maintenance men may be called upon to work in almost any section and may be exposed to all the hazards of TNT manufacture. In one plant they suffered over one-fourth of all injuries that occurred in one month - a larger number of injuries than any other group classified. Of course, the dangers of their jobs would vary

greatly depending on the type of work and the area in which they are working.

GENERAL HEALTH PROBLEMS

Change Houses

Located at convenient points, they must be equipped with showers, toilets and washing facilities, lockers, and place to eat lunch. First aid men may have their headquarters at these change houses so they can be called quickly to the scene of any accident. Some safety equipment can be kept at the houses and the first aid attendants can attend to sterilizing all personal protective devices before they are reissued to other men.

Drinking Facilities

All houses should have sanitary, angle jet fountains.

Washing Facilities

Sulphonated castor oil, cold and hot water and cloth towels of the sanitary roller variety should be available conveniently to all production employees.

Lunchroom Facilities

Facilities should be available for hot food to production employees as well as office workers.

THE SAFETY DIVISION OF A TYPICAL PLANT

Safety work in a typical plant visited is under the jurisdiction of the General Safety Committee composed of executives. This committee serves in an advisory capacity to the Works Manager on matters of safety. Carrying out of the safety program is in the hands of the Safety Division.

In each area, weekly meetings of supervisors are held for discussions of local hazards and prevention. Accident score boards are posted with the number of days the area has operated without lost-time injury. Each house posts a mimeographed sheet of safety rules. Each new employee receives a copy of the booklet, General Safety Rules, and is instructed during his training period in safety.

In addition to the safety engineer and his assistant, a number of men are trained as safety inspectors and make continual inspection of the plant for unsafe practices of any kind.

Statistical analysis of all injury cases is made monthly.

THE MEDICAL DIVISION OF A TYPICAL PLANT

At present, the Medical Division includes the Medical Director, one other physician and 8 nurses. At least 2 other physicians are needed and effort is being made to find qualified industrial physicians. Twenty-four hour medical care must be available in the hospital in addition to preemployment and periodic examination of employees.

The physical examination has been described in part on page 17. A complete chest X-ray is included in the preemployment examination.

The medical director in this plant feels that pressure for employees and the high turnover is forcing the employment of men who do not meet high standards of physical fitness.

MEP:tvw
10-29-51

EMPLOYMENT OF WOMEN IN ORDNANCE IN WORLD WAR II

CONTENT

Women Workers in Ordnance Plants in World War II

(A brief statement with no figures; could be used (1) for popular purposes or (2) If it were desired not to disclose figures)

Women's Employment in Ammunition Industries in World War II

(A fuller analysis of data giving figures on employment toward the close of World War II and rapid decline shortly thereafter. A check 10/10/51 with Archives indicates these figures were declassified).

Table showing further details of wartime employment, decline, proportions of women, etc. of four industries in the ordnance group that produce explosives.

MEP:tvw
10-11-51

WOMEN WORKERS IN ORDNANCE PLANTS IN WORLD WAR II

Women were more than a third of the workers employed in ordnance plants toward the close of World War II. They were almost half the workers in small-arms ammunition and in the loading and assembly of ammunition, and over half those in artillery ammunition.

More than four-fifths of the women ordnance employees were in ammunition industries; over 40 percent of them were producing artillery ammunition.

The number of women ordnance workers declined rapidly after the war. Within a few months they were only a fourth of such employees as compared to over a third during the war. Of the decline in women's employment in ordnance almost nine-tenths was in ammunition plants.

10-11-51
MEP:tvw

WOMEN'S EMPLOYMENT IN AMMUNITION INDUSTRIES IN WORLD WAR II

Employment in July 1945

Ordnance plants employed about 316,000 women toward the close of World War II. Over four-fifths of these (More than 260,000) were in ammunition industries; more than half of them producing artillery ammunition.

Women constituted over a third of the 880,000 ordnance workers in July, 1945, and about half of those in artillery ammunition, small-arms ammunition, and the loading and assembly of ammunition

Employment in December, 1945

In the five months following World War II, the total number of employees in ordnance plants declined by 87 percent, the number of women by over 90 percent

The ordnance workers in December, 1945 were only 13 percent of the number in the previous July; the women so employed in December were only 9 percent of those in ordnance plants in July, 1945. These women constituted only a fourth of the December ordnance workers compared to over a third of those in July.

Of the decline in total employment in ordnance plants, 10 percent was in the ammunition industries. For women the proportion was even greater - almost 90 percent of the decline in ordnance was in ammunition plants.

MEP:tvw
10-11-51

EMPLOYMENT OF WOMEN IN ORDNANCE IN WORLD WAR II

Industry and Status	July, 1945			December, 1945			Ratio of Dec. 1945 to July, 1945	
		Women			Women			
	All employees	Number	Percent of total	All employees	Number	Percent of total	Total	Women
Ordnance 1/	880,138	315,950	36	115,839	29,108	25	13	9
Artillery Ammunition 2/	272,915	140,160	51	6,236	1,811	29	2	1
Bombs, Mines, Torpedoes	124,015	41,549	34	8,947	1,944	22	7	5
Ammunition, loading and Assembly & N.E.C.	104,237 3/	48,973 4/	47	4,258	1,060	25	4	2
Small-Arms Ammunition	64,642	30,222	47	11,670	3,211	28	18	11
4 Industries								
Number	565,809	260,904	46	31,111	8,026	26	5	3
Percent of all ordnance	64	82		27	28			
Decline, July - December, 1945								
Total ordnance - Number				- 764,299	- 286,842	37		
Percent				87	91			
4 Industries - No.				- 534,698	-252,788	47		
Percent of total decline				70	88			

1/ Include also guns and mounts, combat tanks, metal ammunition boxes, fire-control instruments, ordnance N.E.C.
2/ See W.B. Bu. 192-2 for use of TNT and Tetryl in this industry.
3/ 98,724 plus 5,513
4/ 46,605 plus 2,368

Source: Unpublished data on women furnished the Women's Bureau from Form 732 of the War Production Board and the Civilian Production Authority.

MEP:tvw
10-10-51

(3)

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

Prepared for WB Bul 194
P.p 28-32
(no extra copies)

THE EXPOSURE OF WOMEN TO INDUSTRIAL HEALTH HAZARDS IN WAR PLANTS IN A LARGE INDUSTRIAL STATE, 1942

February 1943
~~(Reprinted October 1951)~~

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THE EXPOSURE OF WOMEN TO INDUSTRIAL HEALTH HAZARDS IN WAR PLANTS IN A LARGE INDUSTRIAL STATE, 1942

Effect of War Conditions on Industrial Health.

The increasing diversity of women's work in the war program has implications not only for greater opportunity to use talents and to secure better wages than in more customary women's employment. It also increases exposures of women to toxic materials to which they rarely have been exposed in modern American industry. The industries surveyed included:

Ammunition	Aircraft accessories
Plastics	Aircraft and marine instruments
Other chemicals	Rubber products
Porcelain parts	Small metal parts
Electrical apparatus and supplies	Machinery and vehicles
Insulated wires and cables	

Women were at work on a great variety of occupations exposing them to diverse hazards. Not only are the number of hazards increased and the number of exposed women increased, but exposures themselves were found to be intensified by many factors: (1) Longer hours, (2) shortened lunch periods, (3) pressure for increased production, (4) overcrowding of workers, (5) use of makeshift facilities for washing, (6) allowing too little time for washing and cleaning up before leaving work, and (7) increased fatigue because of constant standing, reaching, standing on concrete floors, sitting on backless stools or chairs of the kitchen chair variety.

Fatigue always lowers resistance to occupational poisons as to other disease hazards. The longer the hours the longer the exposure to the poisons. If washing is not adequate the worker may be exposed for 24 hours a day through her contaminated skin or clothing. The poison may even be ingested with food if hands and nails

haven't been adequately washed. Doubling and trebling the number of people in the same working space may mean that ventilation adequate for the smaller number needs retesting for the larger number. A final wartime factor is equally important - the greater difficulty of providing adequate medical care including preemployment physical examinations coupled with the increasing percentage of applicants who are physically under par.

A great many more or less unfamiliar industrial poisons have come into use with war production, in the necessity for accelerated production of explosives, artificial rubber, and all the numerous articles of army and navy ordnance as well as substitutes for civilian consumption.

Potential Exposures of Women.

In the industries surveyed ~~in New Jersey~~ women were found exposed to the materials or conditions classified according to their potential harmful results in the following:

Dermatitis producers	Benzol
	Tetryl
	Mercury fulminate
	Mica
	Pyranol
	Gloss silk
	Cutting oils and compounds
	Plastics
	Dyes

Systemic poisoning - - - - - -	Lead in various compounds
	Benzol
	Radium
	Tetryl
	Mercury
	Carbon monoxide
Acid burns - - - - - - - - - -	Nitric Acid
X-ray burns - - - - - - - - -	X-ray
Respiratory infections - - - - -	Silica dust
	Mica dust
	Steel dust
Heat prostration - - - - - - -	Excessive heat

Systemic Poisoning.

There was evidence that most firms with notable exceptions recognized the serious possibilities of these exposures and were using approved engineering and medical methods of control. This was particularly true of the systemic poisons listed. ~~There were, however, notable exceptions to this rule.~~ The following brief descriptions indicate this: ~~Systemic Poisons.~~

Lead exp~~osures~~osures - Girls employed weighing and blending dyes which consist of lead compounds are provided with two sets of lockers. Work clothing is placed in one locker, a shower taken and street clothing taken from another locker. Every three months a medical examination determines whether the girl is being affected by her work. The company has through its precautions had no case of lead poisoning in nine years of operation. (Engineering control of dusts by exhaust are not mentioned.)

Another company employing girl inspectors of white tin plate felt that cuts and scratches could result in lead poisoning and their emphasis was on immediate first aid for the slightest abrasion. Such exposure would be very slight compared to work with lead dust. It has been established that respiration of lead is most to be feared in industry.

Radium exposures - The use of radium in instrument manufacture was under such carefully controlled conditions as have been recommended by the U. S. Public Health Service. Painting is done on work tables of enameled metal under glass enclosed hoods equipped with exhausts, by girls under constant medical surveillance. Conditions are prescribed for maintaining their health. No personal property is brought into the work room, the washing routine is rigid, and is done on working time. After washing with soap and hot water the radium painter enters a dark room containing mercury lamps which show up minute particles of luminous material. Further cleansing removes these particles. A check is made on the radon concentration in the workroom.

Benzol Poisoning exposures - Women working inside barrage balloons with rubber cement having a benzol base were inadequately protected special medical tests indicated. The women themselves reported the fumes so strong they got "drunk" from them. Engineers were working on a means for better ventilation and control under the working conditions necessitated by the job.

Carbon monoxide - Exposure to carbon monoxide from defective gas heaters had caused illness to a number of women in one war plant.

Mercury exposures - Girls exposed to mercury in the manufacture of mercury lamps were under medical supervision. Medical examination was made biweekly. Particular attention was given to dental health. A special solution was provided for teeth cleaning. Showers were not only available but required to be used before

leaving the plant. Methods of controlling mercury dust, fumes, or vapor and the provision of special protective clothing are also important preventives.

Dermatitis Producers . (more exactly, tetranitromethylanilin)

Tetryl - Tetryl is ~~a~~ common ~~industrial exposure to women~~ used in in explosives manufacture where women are at work. Whether it can be the cause of systemic poisoning as well as dermatitis is a question now before industrial hygienists who differ in their conclusions. In a report last summer on 1,258 cases of illness due to tetryl its toxicity was said to have both local and systemic effects. General manifestations were described as secondary anemia, headache, irritability and irregular menstruation. 1/ During World War I it was reported by one British industrial physician, Dr. Enid Smith, that constitutional symptoms were slight. Another physician with women tetryl workers under his care reported disagreeable effects in a watery discharge from the nose, sneezing, and nosebleed. This same physician mentioned as a symptom of tetryl poisoning, a cessation of menstruation of one to two months' duration. 2/ Constitutional symptoms and infrequent ~~flat~~ opt operators should be under careful medical supervision.

Tetryl powder frequently gives rise to irritation of the skin partly because of its crystalline structure and partly because of its chemical nature. The dermatitis may be severe with swelling and intense itching. Workers who perspire freely are more likely to suffer from it. The use of calamine lotion to allay itching has not proved very helpful according to plant medical departments. Effort has been made to transfer affected workers to other work.

1/ L. J. Witkowski, Carl N. Fisher, and Howard D. Murdock. Industrial Illness Due to Tetryl, J. A. M. A., vol. 119, no. 17, pp. 1406-1409. (Aug. 22, 1942.)

2/ U. S. B. L. S. Bul. 219, Industrial Poisons Used ~~on~~ or Produced in the Manufacture of Explosives, by Alice Hamilton, M.D., 1917, p. 48.

Important in prevention is a well ventilated workroom with a dry atmosphere, sufficient clean work clothing and adequate washing facilities. Workers should be instructed to wash their hands before washing their faces. In addition to a good quality of soap, the use of a 5-percent solution of sodium sulphite will convert tetryl into a soluble compound more easily washed off. A water-soluble skin varnish applied to face and forearms before work has been found useful. 3/

Fulminate of Mercury - Another common exposure to women in ammunition manufacture is that of mercury fulminate. It is rapidly being replaced by tetryl and lead azide. Because of the highly explosive nature of the fulminate strict observance is given to avoidance of dust, scrupulous cleanliness, and a separation of processes, all of which decrease the risk of exposure. Fulminate of mercury is a very decided skin irritant and may cause a severe case of dermatitis. Particles may get into small cuts or abrasions and cause small, very sore, ulcers. Applicants for such work should be free from skin disease, and workers should observe strict rules of cleanliness.

Cutting oils - A number of metal manufacturing companies reported cutting oils and compounds as the principal dermatitis exposures to their women employees on machine work. Control of these infections as described to the agents consisted in adding an antiseptic to the oil in one plant, in another to frequent medical check and transfer of affected workers as well as choice of applicants for such work who have no skin lesions.

Cutting oils are the most frequent cause of dermatitis among metal workers according to reports of United States Public Health Service. Their prevention among women workers merits much attention because of the great increase in woman employment

3/ J. of Royal Academy of Medicine, Vol. 71, 1938. Treatment and Prevention of Industrial Diseases in Filling Factories, by A. Leigh Silver, M.D.

in metal industries. New employees not selected on the basis of susceptibility naturally show a high rate of cases.

The dermatitis may begin with comedones of the hands and arms. Folliculitis of arms and thighs is the common type. Infected follicles may develop into boils and even carbuncles and infection of wounds of the skin caused by metallic slivers may cause the development of boils. The defatting action of cutting oils on the skin may cause drying, cracking, and fissuring of the skin. The open fissures are subject to secondary infection. Dry skins are most likely to be affected in this way. Some of the oils may contain chlorine compounds, the dermatitis taking the form of a typical chloracne. Allergic eczemas occasionally occur from contact with machine oils. The addition of strong antiseptics to the oil may itself be the cause of such skin infection. 4/

Prevention briefly summarized should include (1) provision of facilities and time for personal cleanliness, (2) clean work clothes and impervious sleeves and aprons to protect arms and thighs, (3) provision of clean cloths for wiping hands, (4) removal of metal slivers from oil, (5) change of oil at least once a week. Reused oil should be screened to remove metal, sterilized and neutralized. Of these personal cleanliness is the most important item. 5/

Plastics - A variety of materials used in the manufacture of plastics and dyes may cause dermatitis among susceptible persons. In plants where such reactions were reported the control method considered best was transfer of the susceptible worker to another job. When transfer was impossible the affected worker was given time off from work until the skin condition cleared up and on return to the job protective creams or protective gloves were furnished.

4/ Louis Schwartz, Dermatitis from Cutting Oils, Industrial Medicine, May 1942, p. 228-233.
5/ Ibid.

Respiratory Infections.

In a number of instances women were found needlessly exposed to harmful dusts. In one the women were fettling small porcelain ware without adequate exhaust ventilation. That this operation may cause dangerous concentrations of silica dust is shown by the 1939 study of the pottery industry made by the United States Public Health Service. 6/ The study also shows how harmful concentrations can be controlled over down-draft ventilation.

Exposure to mica dust noted in another plant was stated to have caused skin rashes. The methods of control to prevent respiration of mica are not discussed.

Other Exposures.

Frequent medical examination was given as the principal method of preventing burns to girls working in the X-ray room of a plant manufacturing radio transmitting and receiving equipment. Well established methods are known for the prevention of X-ray burns and, no doubt, were in effect.

Excessive heat was a problem to be met in certain operations in radio manufacture. Young women were employed on the basis of their greater ability to withstand the effects of high temperatures. Whether or not this age specification had been based on comparative experience is not stated. There is evidence that older women withstand fatigue somewhat better than young girls. Protective clothing was provided for the work, including goggles and asbestos gloves. Prevention of heat exhaustion should also include provision of salt tablets and cool water to replace salt and moisture lost by the body in perspiration. Frequent relief, perhaps a brief rest hourly, from work in this room is advisable to prevent overfatigue.

6/ Women's Bureau Bulletin No. 184, The Occurrence and Prevention of Occupational Diseases Among Women, 1935, to 1938, pp. 37-39.

The women employees themselves often complained of the hours of continual standing sometimes on concrete floors or the backstrain from sitting all day on backless stools or chairs not adjustable to the individual, the nerve strain resulting from the urging for greater and greater production, the monotony of certain machine operation, fatigue from lifting too much or lifting or holding material at awkward heights, local fatigue from continual use of a certain muscle group or from a peculiar position required by the work.

~~While~~ some companies had taken steps to counteract the fatigue from strains of this sort, in one where jump presses required continual standing and jumping, the girl operators were given ten minutes rest in each hour of work. This company chose tall girls for jobs requiring reaching to lessen the fatigue resulting from such work. In many more instances rest periods should be introduced. They are especially necessary in monotonous jobs and jobs causing local muscle strain. Wherever introduced the result has been to increase production. Consideration should be given to the well known fact that the properly seated woman worker is a much more productive worker.

Women have been so successful in work with very small parts and in the fine, close inspection work necessary throughout war industry, that eyestrain assumes an important health hazard to women war workers. One company devised a method of having the work done under magnifying glass. Other necessary precautions include excellent lighting for the work, and provision of good posture seating. It is especially important that every applicant for close work have a thorough eye examination. Necessary corrections should be made before starting work.

M-6298

Magazine Division
Office of War Information
Social Security Building
Washington, D. C.

WOMEN CHEMISTS

There are jobs for women with training in chemistry in both government and private industry. The American Chemical Society estimates that industrial need for graduate chemists for existing chemical industries and for new industries in synthetic rubber, high-octane gasoline, etc. is more than twice the available supply. The jobs are:

Chemical analysis
Operation or control of industrial chemical apparatus
Test operations, such as specific gravity determination or acidity measurements.

The United States Civil Service Commission needs:

Junior Chemists
Chemical Aids
Chemists
Technical and Scientific Aids in Chemistry
Trainees, Technical and Scientific Aids

Women with high school diplomas, college degrees, or long records of responsible industrial employment are eligible for training courses under the Engineering, Science and Management War Training Program, which is administered by the United States Office of Education. No outstanding physical requirements must be met, since the work is comparable to office work in its physical demands. Employers are reluctant to take women over 40 if they can get younger women. Qualifications for Civil Service positions are:

1. Junior Chemists - completion of a four year college course including 30 semester hours of chemistry.

2. Chemical Aids - completion of three years of college study including 24 semester hours of chemistry.

3. Chemists - college degree plus a minimum of two years of professional experience or appropriate graduate study.

4. Technical and Scientific Aids - successful completion of an ESMWT course in chemistry, or at least one year full time experience, or one year of college study including a course in chemistry. For higher grades, additional study and experience is required.

5. Trainee, Scientific and Technical Aid - at least one high school course in chemistry, plus passing grade in written aptitude test.

Most ESMWT courses last from 12 to 16 weeks. Full time courses meet 40 or more hours a week, usually in the daytime. Part-time courses meet two or more evenings a week for two or three hours an evening. Special schedules can be arranged for employed persons. All training is of the scope and difficulty usual in college course, but the courses are shorter and aimed at grounding leading toward specific employment. ESMWT courses are given at colleges and universities throughout the country. No tuition fees are required. Trainees must pay for textbooks and minor supplies.

Although women chemists were employed by the government before the war, and occasionally by industry, most of the jobs in these fields are not traditionally women's jobs, but women are needed to replace men called to military service, and to fill critical positions created by war needs.

About 140,000 women have thus far been trained in ESMWT courses in all fields. Industry continues to request the training of women in these fields. While there is still some employer resistance to the use of women, in practically all places where they have been given an opportunity to work, they have overcome this prejudice. Older and handicapped women can do these jobs if properly trained, but there is some employer resistance to their utilization.

Examples of women at work on chemical jobs in industry can be secured from Mr. William T. Clark, United States Office of Education, Room 2249, Interior Building, Washington, D.C. For women holding chemical jobs in Government Agencies, the following may be consulted:

U. S. Department of Agriculture -
- Bureau of Agricultural and Industrial Chemistry
- Bureau of Entomology and Plant Quarantine
- Bureau of Home Nutrition and Home Economics
- Bureau of Plant Industry

U. S. Public Health Service

Bureau of Standards

War Department

Navy Department

This material was compiled in connection with the program to promote full use of womanpower in necessary civilian jobs which is being sponsored by the Office of War Information and the War Manpower Commission with the cooperation of national magazines.

Diamond Dies

Bloch: 5655

Return to R

OFFICE OF WAR INFORMATION
WAR PRODUCTION BOARD

For Immediate Release
Thursday, June 24, 1943

WPB-3918

Women have been found to be men's equals or betters in making diamond dies, the War Production Board revealed today. This finding is the result of a survey and study made by the Diamond Die Unit of the Miscellaneous Minerals Division of WPB.

The investigation was started after the unit had received reports that women were inferior to men in this industry and were turning out inferior dies.

The WPB amassed considerable data from wire-drawing companies giving records of poundage drawn through complete shipments from most die plants. These records reveal that dies from plants where women are employed are in no respect inferior to those from plants manned by their husbands and brothers. In fact, plants which employ a considerable proportion of women show better averages than the all-male outfits.

a very narrow industry in eastern area

In 8 of 9 plants women comprise 30 to 90% of employees.

X-17274

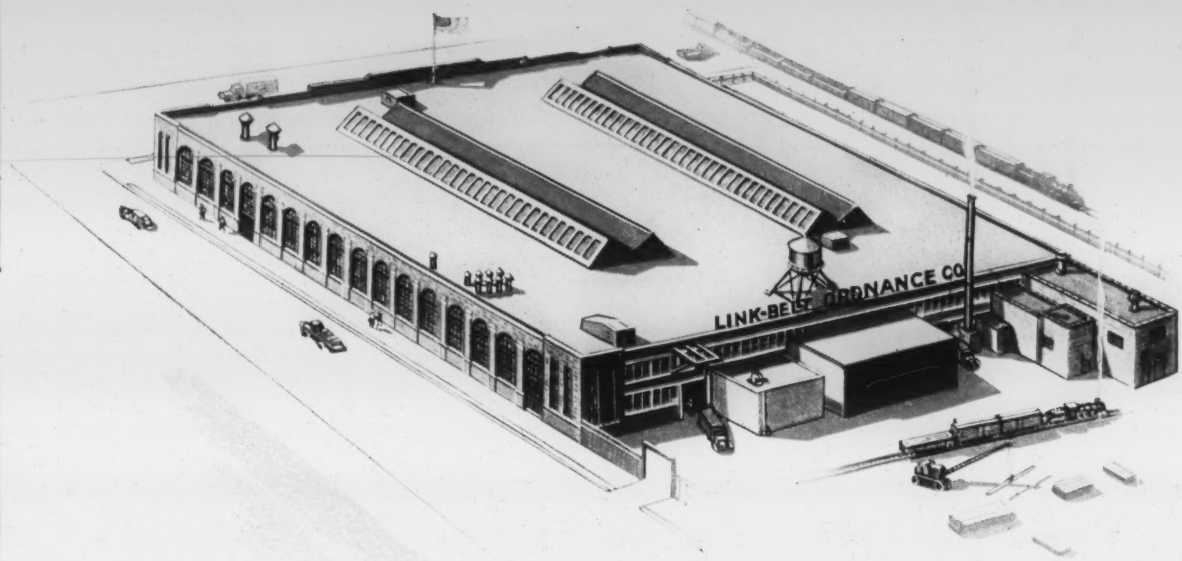
Bloch to RN 7/30/43

A Message from the WOMEN SOLDIERS of the PRODUCTION FRONT

1943

WOMEN'S BUREAU
AUG 30 1943
DEPARTMENT OF LABOR

LINK-BELT ORDNANCE COMPANY
CHICAGO



FOREWORD

OUR company has a policy, or shall we say practice, of helping us, girls and men alike, to realize that we are an integral and appreciated part of our organization. Recently, we girls, who now comprise one-sixth of our entire personnel, were asked to select one girl representative from each of our manufacturing departments in the plant.

The girls we chose were to be the delegates at the monthly meeting of the supervisory group. Each of them was then given a general idea of her topic and, in addition, was given "free rein" to speak on that subject.

Since their views so reflected our general trend of thought, we were most anxious to submit them for publication, in the hope that we might be contributing to a more positive picture of women on the production front. More than that, we earnestly desired to bring about a closer relationship and a deeper understanding between the time-honored and long-enduring traditions of industry and — ourselves.

So we offer our views as expressed herein with just a touch of forgivable pride, and a sincere deference to the industrial might of man-made American industry.

—The Girls of Link-Belt Ordnance

WHY I AM A

When we were asked to select one of our group to represent us at a plant supervisory meeting we chose

IRENE EADS,

who we thought would most clearly express the ideas and sentiments of all of us—The Girl Welders

WHEN I decided to go into war work, I wanted to do the type of work in which I could feel that I was accomplishing something worth while. I believe it is most important to be deeply interested in any job in order to achieve the best results, and after months at an occupation which has proved a rigid test I am more convinced than ever that welding is just that type of engrossing job.

During my six weeks in welding school there were many times when I doubted my eventual ability to pass the government test. Nevertheless, my desire to train myself to become efficient at a new and challenging job impelled me to continue. During the first few weeks, scarcely any member of our class realized the importance of our training. Entering a field so completely foreign in every respect as compared to our previous occupations, we were slow to realize how essential would be our place in industry.

Before we were enrolled as welders I suppose most of us thought we would become defense glamour girls in snappy uniforms and colorful play shoes. However, after our first glimpse of ourselves in men's roomy coveralls and other regulation safety apparel, these ideas were promptly discarded, for somehow our feminine appearance began to diminish as the real worth of the job began to unfold.

Speaking of protective clothing devices, I shall never forget my first attempt to buy safety shoes. Another somewhat bewildered student welder and I went to a Loop store and with some uncertainty told the sales girl what we wanted. When we mentioned the approximate weight of steel the shoes would have to bear, she audibly gasped and in all sincerity exclaimed, "For goodness sakes. If I were you I'd stay away—*far* away from steel!"

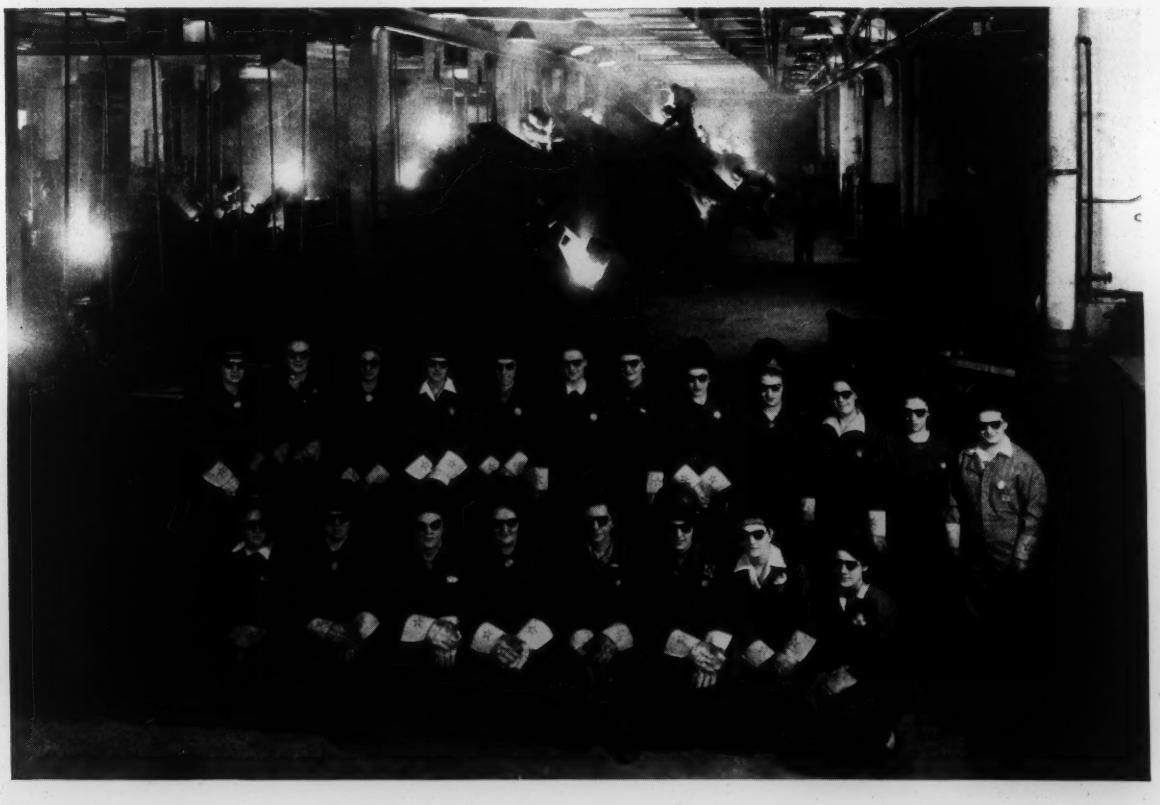
After these confusing six weeks in a new world, we took the government welding test and quite suddenly found ourselves Welders . . . at least *we* thought we were. However, the more experienced people in the shop twinkled with skepticism for we were the "guinea pigs" of this experiment. As a matter of fact we didn't have the slightest idea where to start on a job until somebody showed us the exact spot on which to strike the arc.

Welding is not an easy job. It is dirty, hot and tiresome, and requires, in addition, intense concentration and endless patience. Nevertheless, with all the discomforts and very real physical effort it still remains so

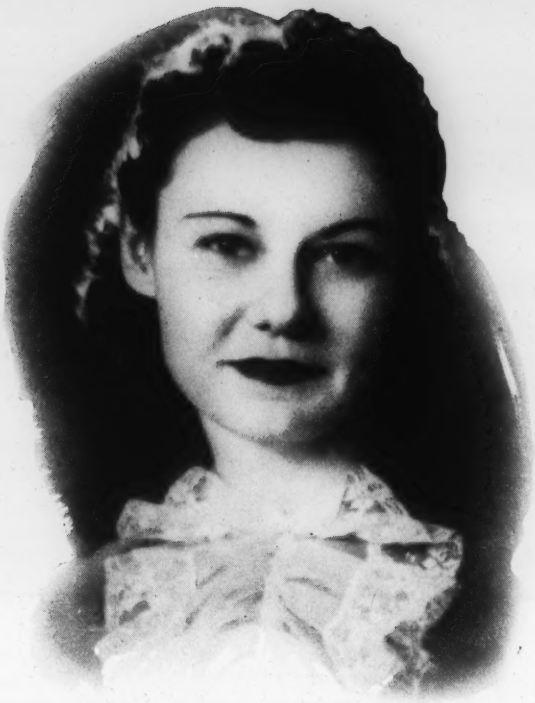
WELDER «

fascinating and so very absorbing, I am sure I wouldn't give it up for any other work, especially during this crisis when we can truly feel confident that we are "doing a man's job." Despite our real fatigue and petty surface grumbling I think all the girls feel as I do. I have heard them all say many things about welding but never once have they intimated that they didn't *like* it. I feel I have really accomplished something when I see the completed gun and know that my welding number is stamped on some vital part of it.

I think that all the women welders at Link-Belt Ordnance have come to understand how much their combined strength and ability will mean to the nation in winning this war. Speaking for myself I can honestly say that the past five months I have spent in the steel shop have been well worth every aching muscle, every drop of sweat (and I've shed many a drop), and every callous on my hands it has cost me to remain there. I have no desire to spend the rest of my life keeping my eyes focused on an arc light, but, knowing I will be doing just that for sometime to come, I am content in the knowledge that my own hands in some small way are helping the cause for which all of us are fighting.



WORKING IN INDUSTRY



Since ETHEL BUREK had more experience in industry than the rest of us we thought she could better express the experiences and attitudes of the girls in our department—The Machine Shop Girls

IN VIEW of the fact that I was employed in industry before women played such a necessary part in it, I would like to mention just a few of the conditions that existed prior to the war, and the general conception of girls about industry then and now.

Prior to the time I came to Link-Belt, I worked in an industrial plant where my job was one of folding paper on a unifold machine. All of my co-workers were women with the exception of one man who set up our machines. I can truthfully say that the work was just a job to the girls and I mean a job in name only. To be perfectly frank about it, the uppermost thought in each of their minds was "to get a man" so they wouldn't have to work any more. Even though we worked on a unit basis, we never had time to go on a rest such as our two fifteen-minute periods here, and even if we did, we had no place to sit down let alone lounge in a comfortable place like the one provided for us at Link-Belt Ordnance.

There were only two girls when I came to work here and now that we see so very many, I feel almost like a veteran, since I happened to be lucky enough to be the third one employed. Most of the girls are like myself . . . they are married and fully realize the importance of their jobs. It is a job which provides not only a livelihood but a satisfaction derived from the assurance of its tremendous importance. Then, too, it is interesting to note that none of the girls has a desire for a future career of machine shop work, for their inevitable comment is, "Let the men have their jobs back and we'll stay home and raise a family."

Before starting to work here I was of the opinion (and I believe most other girls were, too) that the workers in machine shops were rough, and that general conditions were very undesirable for girls. However, all of us were agreeably surprised to find that we were quite mistaken. In operating a milling machine and turning out housings and racks used in the leveling unit of our gun, I find that the work is not at all what I had been erroneously led to believe.

As for the men, I can only say that I have found them to be very patient, helpful and courteous . . . and this in face of the fact that women have, in a sense, encroached upon their field, even though necessarily so. Nevertheless, a couple of years ago these same men would probably have raised an eyebrow at the very thought of a woman running a machine that had been strictly a man's job. They've done it, though, and if I must say it myself, I think most of them have done it well.

Of course, where there are so many women we will find a certain percentage who find it hard to adapt themselves to the work. But in our machine department, girls of many types do just as many types of jobs. They operate surface grinders, grinding racks and slides; they run the drill presses, drilling slides, hous-

BEFORE THE WAR AND NOW

ings and steel plates; and they operate the milling machines where they mill all types of housings. Now all this doesn't include the other departments. I hear girls speak of other types of machine work as well, such as tool making, welding, assembly, magnaflux, inspection, and many other jobs. Since most of the work is too heavy for the women, many improvements have been introduced in industry. Women's presence has necessitated doing some jobs in a different way and, in many instances, it has resulted not only in easing the physical effort for a woman but has proved to be a more practical and efficient way of doing the work.

Some foremen say (and all of us girls are *delighted* to hear it!!) that they find a woman takes more pride in turning out a finished product than a man does. Possibly this is due to the fact that we have more patience or that we are more eager to learn and want to do the job right, or maybe it's because we know less than the men when we start, and naturally we are proud when we find we can do it.

To sum it all up, I believe that most of our supervisors will agree that if a girl is treated as such she will do a job comparable to that of a man, taking into consideration, of course, her lack of man's physical capabilities. With this parting word, I can only say that the length of time I have been working at Link-Belt Ordnance proves how much I enjoy my work, and I hope that this is one of the reasons the girls chose me to represent them here tonight.

HOW OUR GIRLS FEEL

KAY VERBIAR,
now in the Marine Corps, was one of the oldest members of our department in months of service. Since the tool room was formerly "the starting point" we girls thought Kay would have a very good general idea about how we felt about war work—The Tool Room Girls

SO MUCH has been said and written about women in war work that I am glad to have the chance to mention just a few things that are applicable to all women war workers. The novelty of the fact that they are "women" doing a job to which they are unaccustomed, is the basic reason why they are observed from a different point of view. The operation of machines has always been a man's job, but since the war began, women are entering that field in great numbers. This is very evident even in our own plant, for when I first came to Link-Belt Ordnance Company there were just four other girls besides me. Now of our 1200 employees, 200 are women and as time goes on many more probably will be added to replace our men for active service.

The type of work which we do in our plant has made us much more confident, for we have learned that we can make those once frightening machines do what we want them to do, and our first inferiority complex around machinery is fast disappearing. In mastering these machines, we gain a new sense of efficiency which in some small way helps us to manage our homes and daily lives better. Then too, although not to be unexpected, it has given us a new sense of accuracy because of the great amount of precision work that we do. Things are no longer "about that long" or "about so wide" but they are *exactly* that long and *exactly* so wide, even to fine tolerances of minute measurements. We know the power of our gun depends in great part on the efficiency of the tools we make, and this gives us a greater sense of responsibility in the knowledge that our mistakes can result in far greater ones.

In most cases, the physical strain upon a girl is not nearly so great as the mental one, for she can more quickly adapt her body to increased physical effort. However, all the intricacies and complexities of a machine present to her a mental problem that is far greater to cope with than physical effort. An interesting side light on women in industry is the effect which it has had upon broadening their technical vocabulary. For example: the other day a man came to the tool room window and asked for a dog with a short tail. Now just the day before, Ann was sent to another department for a "*steel* stretcher" and naturally it was some time before she was convinced that there really was such a tool as a "dog with a short tail."

Our entrance into war work has affected the men in various ways. They are now, for example, a little more careful about their appearance and speech because the girls never use profane language either in the shop or on the outside. (Some of the boys think Miss Verbiar was just joking here.) Our outward appearance has not changed since we got into war work except that we now wear coveralls instead of dresses. In spite of the masculine coveralls, most of the girls try to maintain their feminine appearance by wearing makeup in the plant and by keeping attractive the little bit of hair that does show. All of us have heard about girls right here in Chicago who have had terrible accidents when their

ABOUT WAR WORK

hair caught in machinery and that is one of the reasons we wear bandannas. The girls who really want to do a good job know that they can do this only by being careful to prevent injuries to themselves and others, and therefore realize the importance of protective clothing. It has been found that some girls are allergic to steel dust, oil and cooling lubricants and these girls are provided with gloves, masks, and aprons. If these protective devices do not remedy the situation, the girl is soon changed to a different type of work.

I think all girls believe that their immediate supervisors should realize that every employee, man or woman, likes to be treated according to the "Golden Rule." Each of us likes to be praised when we know we have done a job as well or better than was expected of us, for *all* of us don't *always* make mistakes.

In conclusion, I think I speak for all of the girls when I say that we *do* appreciate the little things that are done for us by the men in general and if they realize just a little more that we'll work as hard as our physical limitations will permit, we'll all go a long way toward doing that *better job* that we would like to be helped to do.

INTERESTING FACTS

JUNE MURPHY,
who has recently been appointed Safety Director, formerly worked in the assembly department with us. We chose her to represent our department because her previous occupations had been as varied as some of ours—The Assembly Dept. Girls

TO HITLER'S ringing challenge "Americans are soft" and to the treachery of a nation we once befriended, came an answer not only from government and military leaders, not only from the long assembly lines of American men in production, but it came also from that unexpected, but welcome source . . . American women.

Soft? We need only to look at the girls from our own Link-Belt Ordnance Company for the indisputable answer. These girls have responded to that challenge, for as wives, mothers and sweethearts, they work shoulder to shoulder with the men, confident in their belief that they are "doing a job."

Where did they come from? Were they trained for industrial pursuits? Well, for the answer let's consider our assembly girls. A few short months ago they were dainty beauticians, pert stenographers, trim waitresses, efficient clerks, and gracious entertainers. But now look at them . . . not only working the same shifts as the men but some are at the same time maintaining homes and raising families, budgeting their time and energy to the amazement of those who have never tried it.

There is Veronica Buck in sub-assembly who as a manicurist has discarded her delicate nail files to wield the more essential kind. There is Ann Presol now vigorously applying paint to the outriggers instead of applying paint of a different type to the faces of "would-be" beauties. Evelyn Ashley, our crane operator, formerly an entertainer, still retains her charm but pushes mechanical levers instead of the more musical ones on her accordion. Then we have Edna Swanberg whose "then and now" occupations also present a striking contrast. Edna was formerly a corsetiere and has been doing such a fine job here that she has been given full responsibility of testing the Sperry units.

Yes, all are doing work which sometime ago they never dreamed they would be doing. One job in John Paton's department looks as though it is closely allied to agricultural pursuits, but Mildred, Sophie, Pauline and Charlotte will tell you in all sincerity that they are not "churning butter" . . . but, lapping a bearing. And then we have the petite girls in Larry Basile's department. Jo, Florence, Juanita, and Beatrice are just about the tiniest girls in the plant. They are our "little girls" doing "big jobs." Down in main assembly, where the girls work on more complete parts, there is a lively spirit of keen competition, each of them trying to see which finishes first, and each of them feeling a strong sense of pride in knowing that they are putting on the final touches to the completed gun.

All of us are proud of our safety record because, with a few minor exceptions, we have worked without injury. Ironically enough, though, Flossie Kinney who worked in the plant for a long time without injury went home the other night and sustained a severe cut on her hand from a broken bottle that her child had placed in the refrigerator.

For most of us our reasons for replacing our frills for our coveralls are just about the same. It may be a husband, sweetheart, or brother doing his part that has awakened in us a patriotic sense of responsibility which makes us realize that we too must do our part. It was dreadfully hard at first and somehow frightening too, for there are many adjustments to be made when stepping from one environment into a completely different and

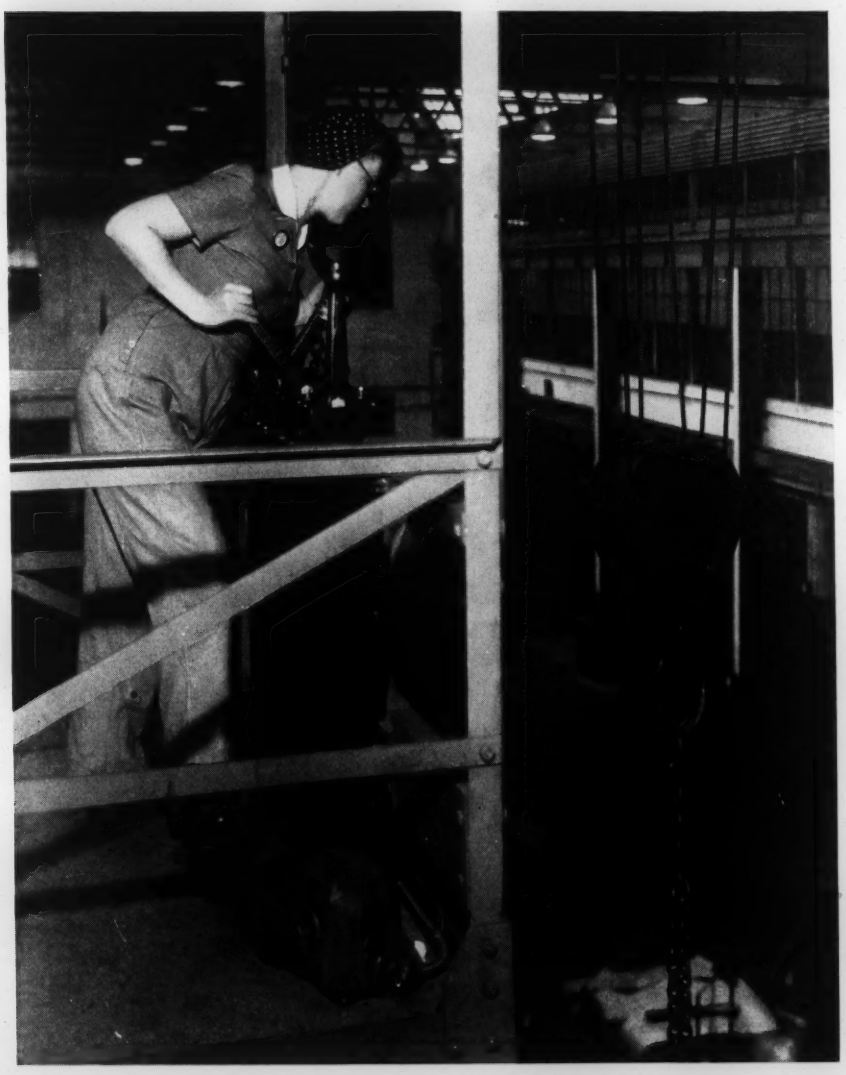
ABOUT OUR GIRLS « «

unfamiliar one. The plant was a new world and we found ourselves surrounded by queer objects without names. For myself, I believe I knew just how a baby feels upon beginning to notice things, for there was a total strangeness and then gradually I learned and began to get my bearings.

I can sincerely say that now I enjoy my work very much . . . much more than I thought possible, and I am sure that I am expressing the view of the other girls in our department. We have learned many things and one of the most important of these, I think, is that each of us realizes that each of our jobs, no matter how small, is a task that is absolutely necessary to bind together a perfect gun. Each part that we work on cannot be "almost right" but must be precisely correct to avoid costly waste of materials and working hours. From my position up in the crane I have an excellent view of almost everything that happens in main assembly. And after being up there for almost six months I still find the procedure below alive with interest, with something new to be learned each day. I have seen much valuable time lost by a worker's miscalculations or negligence, and just as much saved by a worker's foresight and alert suggestion.

One of the things that impressed all of us girls, I believe, was the attitude of the men with whom we work. We expected them to be more or less skeptical, yes, even somewhat belligerent, but we were delighted to find that this was far from being the case; we found our men co-workers to be helpful and most considerate. This is also true of our immediate supervisors who, in the majority of cases, are understanding and tolerant, yes, even long suffering. They are ready to pass along to us the knowledge they have acquired over a long period of time and to treat us, not just as cogs in the great machine that is our organization, but as individual and distinct personalities.

We crane operators experience a deep feeling of satisfaction and pride each time we help to assemble the gun, for we feel that we have done our small part to speed arms to the men who are doing such a great job. Of course, the day will come, and we all hope it will be very soon, when our total victory makes the war plants today unnecessary. We will all go back to our respective occupations and careers much, much the wiser, taking with us the many valuable lessons learned in cooperation, exactitude, discipline and numerous other things applicable not only to our work here but to our chosen vocations and daily life as well. For many of us this training and experience will make possible better positions for the future than we were ever before equipped to fill.



And so, hats off to the women of Link-Belt Ordnance. They know they have a job to do and they are doing that job with the help of the men here, for the help of the men "over there."

LINK-BELT ORDNANCE COMPANY
CHICAGO

BOOK 1950-5-43

PRINTED IN U.S.A.

OCCUPATIONS

ORDNANCE & EXPLOSIVES - 1944

Outdated Pay Rates Are Found Big Factor in Tire Output Lag

AKRON, Ohio, Aug. 17 (AP) — Continuance of outdated pay rates for newly created rubber industry jobs—a system to which "both management and labor are opposed"—has cost from 30 to 60 per cent in worker productivity of heavy duty tires, the War Manpower Commission asserted today.

Reporting on a 10-week survey made to determine methods of meeting "utmost urgency" demands for more heavy tires, the WMC declared:

"Production likely could be increased 10 to 15 per cent provided both management and labor agreed mutually to correct certain deficiencies for which each appears partially responsible."

The report was presented to Akron rubber executives by Harry C. Markle, local WMC director, and D. Alan Strachan, of the War Production Board's labor division.

Terming the called-for speedup "an abnormal effort volunteered by the worker to help break the production bottleneck," the report listed eight "utilization factors definitely affecting production:"

1. Individual workers' ability to produce, whether caused by production limits imposed, machine failure, uneven flow of materials, lack of maintenance crew manpower or other factors.

"During the . . . next 90 days," asserted Mr. Markle, "it is possible to increase production of heavy duty tires 10 to 15 per cent by raising the limits or goals on individual produtcion above existing levels. It must be definitely understood . . . that production records made during the emergency should not be used as a basis for cutting rates, enforcing future speedup or restudying jobs."

2. Payment of "past average" wages on jobs which have been changed and on which no new incentive rates have been adopted, has been found to decrease worker productivity from 30 to 60 per cent.

3. Absenteeism.

4. Failure to make greater use of women on jobs now being performed by men.

5. Lack of streamlined production scheduling and controlling of materials flow.

6. Manpower turnover.

7. Inadequate training of both supervisory personnel and union committeemen.

8. Insufficient co-operation in labor-management handling of complaints and grievances.

The survey also "certified a need for an additional 1,446 male workers in the tire program," the report said, adding that WMC recruiters had been sent into 14 Southern States to enlist manpower.

A. T. & T. Pays Usual $2.25

NEW YORK (AP)—Directors of the American Telephone & Telegraph Co. declared the usual quarterly dividend of $2.25 a share on the capital stock, payable Oct. 16 to stock of record Sept. 15.

MARKET GOING UP OR GOING DOWN?

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BOSTON

A woman munitions worker who twice rescued fellow workers after their clothing had been ignited in powder explosions, became the first woman to receive the Civilian Distinguished Service Emblem, highest Army Award to a warworker. (Wash. Post, Apr. 7, 1944, report from Pine Bluff, Ark.)

Overworked Sou

Waste So Far Restricted To Relatively Small Areas

Trouble started when pastures fell into hands of few political favorites—Too many sheep permitted to graze—Even goats add to ruin of grassed areas—Experienced men still control main territories.

Uncensored South America

Thirty-seventh Article in a Series

By Roland Hall Sharp

Staff Correspondent on Latin-American Affairs for The Christian Science Monitor

WRITTEN AS FROM PUNTA ARENAS, Chile—Tall sailing ships once were blown to his southernmost city of the world near the center of Magellan's Straits, and today you are likely to be blown here even if you come in a bus, automobile, airplane, or steamship.

Wind was my first all pervasive impression . . .

Wind that tugs at everything in its path . . .

Wind against which a man can make headway only by strenuous exertion . . .

Wind that whips up ice particles from glaciers hundreds of miles long between Andean ridges and drives in undulating lashings across huddled plains-grass . . .

Wind freshening through the half-light of some days when
en at noon every familiar out-
is transmuted into a realm
'e dust-blown shapes with
d sea and sky fused in
d roaring whole.

s Persistent

'e wind, or prefer
self to it, cross
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midsummer. The season was betokened by a particularly supple and resilient evergreen shrub. On an unusually windy day I thought I saw color among the thrashing green branches.

Sure enough, at the tips were blossoms that must rank among the most hardy in the plant kingdom. Lavender and delicate though they were, they snapped gayly and came back for more. They held the end-spot in this game of crack-the-whip.

Call of the Straits

Everyone with any feel for the open road and the call of the seven seas has wanted some day to go through Magellan's Straits. Since the first ship transited the Panama Canal in 1914, the Straits have ceased to command inter-oceanic travel. Yet they remain for emergency use, and for commerce to and from this port of South America.

Punta Arenas so thrived in days before the Panama Canal that the city has not materially increased its population since then. With some 30,000 residents, Punta Arenas has paved streets, piers, docks, warehouses, parks, hotels of metropolitan atmosphere even if small, an urbanity and progressiveness not anticipated in such remote parts.

HOW THE ARMY PROTECTS ITS WOMEN WAR WORKERS

By Dorothy Barker, Safety Engineer, Sacramento Air Service Command, McClellan Field, California. California Safety Assembly, Los Angeles.
(April 12, 1944, 1400 PWT)

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A bird's-eye view of the extraordinary variety of jobs our women are doing will, perhaps, aid in understanding what a tremendous task the Army Air Forces faced in solving the job training, placement and safety problems of a service depot. An air depot has two major functions which are carried on simultaneously, maintenance and supply of aircraft, both tactical and training. This is typical Army phrasing and perhaps requires some amplification. Maintenance, or the servicing and repairing of planes is the depot's main purpose. New planes are modified to meet the demands of improved design, plane engines from battle fronts are brought here to be completely torn down, cleaned, inspected, repaired and reassembled, while maintenance on bombers and fighter planes is continuous. Women, as aircraft mechanics are helping to do all these jobs. In addition, they build and flight-test bombsites, repair radios, repair instruments, wind armatures, inspect and pack parachutes and life rafts, and assemble propellors, to mention but a few of the many activities undertaken by our women.

Supply activities include the thousands of men and women engaged in the procurement, warehousing, local distribution, packing and shipping to overseas destinations of the myriad parts and materials required by the Army Air Forces in the prosecution of modern war. A steady flow of material involving much handling and moving of heavy, bulky objects is characteristic of this phase of an air depot's activity. Operating fork lifts, tugs, cranes, reaching or climbing ladders to store material in bins or to fill orders, constant lifting, and the unloading of trucks and dollies constitute some of the hazards of warehousing to which women are exposed.

CUT IN MACHINE GUNS TO RELEASE 5 PLANTS

N.Y. Times 12-16-44

WASHINGTON, Dec. 14 (AP)—A $23,000,000 cutback in production of machine guns for Army planes was officially approved tonight. The move, it was explained, would release manpower for more critical ordnance items, including ammunition.

The decision, announced by the Production Executive Committee of the War Production Board, will release 6,000 workers from five plants about Jan. 1.

Immediate action was being taken by the War Manpower Commission to channel the laid-off employes into critical jobs, it was stated.

Output of .50-calibre machine guns for aircraft has been running ahead of schedule. The Army described the adjustment as "a leveling off of machine-gun production and not a complete curtailment."

Meanwhile, informed WPB officials estimated the new gun and shell plant expansion program for 1945 would cost between $250,000,000 and $500,000,000, including construction of facilities for mortar ammunition.

Plants to be affected by the curtailment of orders are: Brown-Lipe-Chapin Division of General Motors, Syracuse; Savage Arms Corporation, Utica; Kelsey Hayes Wheel Company, Plymouth, Mich.; Colt's Patent Firearms Manufacturing Company, Hartford; Buffalo Arms Corporation, Buffalo.

AMMUNITION MAKERS NEED 50,000 RECRUITS

20-44

Special to THE NEW YORK TIMES.

WASHINGTON, July 19—The Army's call for an immediate expansion of the ammunition production program requires the services of 500,000 men and women, Paul V. McNutt, War Manpower Commissioner, said today.

He said that from time to time production had been cut back in many of the ammunition plants, but now the Army had called for an increase of production. From many of these plants, he said, workers had gone to other jobs, while some plants had been partly or completely converted to other production. A few plants were idle, he added.

Mr. McNutt said that the adding 50,000 workers to those already in the ammunition plants by the end of the year would not be the end of the job. The Army's estimate, he said, indicated that early in the next year new peak manpower requirements would have to be met.

N.Y. Times 6-13-44

Women Repair Rifle Stocks

A job assigned to women at Raritan Arensal, Meutchen, N. J., is the reclaiming of damaged rifle stocks sent back from combat zones, the Women's Section of the War Department Bureau of Public Relations, said yesterday. Women disassemble the rifles, rub down the wood to work out the oil and insert new pieces of walnut wood where the stocks have been damaged.

OCCUPATIONS

ORDNANCE + EXLOSIVES - 1945

The Lamp

FEBRUARY, 1945

Return to Benham

"Dancing Time" at Gilbert & Barker

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MR. HICKS

THE recent death of C. J. Hicks, at a time when the relations between employer and employee are receiving increased public attention, forcefully recalls the progress which has been made in industrial relations since its value was recognized.

Mr. Hicks was a great pioneer and national leader in this important field. He was one of the first to give thought to the subject, and he devoted his entire life and effort to raising the standards, not only in the companies with which he was associated but in industry at large.

With the Standard Oil Company (N. J.) he found the greatest scope for practical application of his ideas. The basic principles which have enabled this company to take a position of leadership in industrial relations were established by the company with the help of Mr. Hicks more than 25 years ago when they were far more revolutionary than they would be considered today. Throughout the years, the company has had the benefit of Mr. Hicks's guidance and counsel in improving the original program. In addition, he filled an unusual niche as a human being devoted steadfastly to the service of others.

But he was not a mere dreamer and sympathizer; he worked hard to put his ideals to practical use. He went about every task with vigor. His keen mind cut swiftly through masses of verbiage to get at the essentials. He made decisions quickly. He never abandoned a goal on which he had set his mind, but he was always willing to travel the other man's route toward it if this route was smoother than his own.

The best illustration of Mr. Hicks's practical idealism is the method he used to bring about the improvement he sought. He favored clearly enunciated principles. Taken together, these principles worked out by Mr. Hicks and this company made up the company's policy in its dealings with employees. The company voluntarily assumed the obligations laid down in this policy. The employees' obligation was loyal service. This, it was expected, would come as a spontaneous response to a company program of fair dealing.

Things have worked out in just that way. From the time definite principles were established, they have been largely responsible for the successful relationships between management and employees. These relationships are not outgrowths of paternalism or self-interest, but spring from recognition by both groups of their mutual responsibilities. The company's greatest asset is its employees. By the same token, the greatest strength of the employee group rests in its loyalty to the organization which has a basic policy of fairness and justice.

In the tireless struggle for industrial peace which Mr. Hicks carried on for more than a quarter-century, he won the respect and devotion of both labor and management. He was not only a good counselor, but a friendly one in whom both groups were able to confide. His monument is the ever-increasing gain in understanding between employers and employees which his labors did so much to bring about.

Additional details concerning Mr. Hicks will be found on page 23.

◄ **LUBRICATING OIL** in 50-gallon drums is swung onto lighters at New York harbor for transfer to Liberty ships. Including oil changes, a Flying Fortress uses one drum of motor oil about every five hours during flight

The Lamp

FEBRUARY, 1945 *VOL. 27 NO. 1*

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PICTURE CREDITS: Inside front and back covers, *Pages* 10, 24, 26, Gordon Parks for Standard Oil Company (N. J.); *Pages* 2, 27, Harold Corsini for Standard Oil Company (N. J.); *Page* 3, Sol Libsohn for Standard Oil Company (N. J.); *Pages* 4, 5, 6, 7, Edwin Rosskam for Standard Oil Company (N. J.); *Pages* 8, 9, graphics by A. Houghtelling; *Page* 11, Esther Bubley for Standard Oil Company (N. J.); *Page* 13, Jacob Lofman for Standard Oil Company (N. J.); *Pages* 16, 17, 18, 19, 20, 21, John Vachon for Standard Oil Company (N. J.); *Page* 23, Blank & Stoller; *Page* 22, Free Lance Photographers Guild; Outside back cover, A. Petrucelli.

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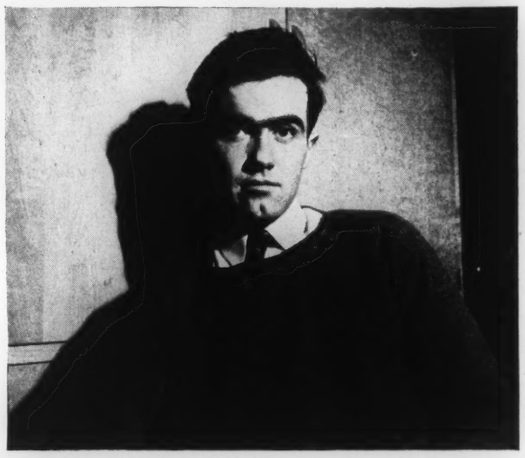

FOR THE COVER, watercolors and Conté crayon drawings in this issue, Donald Burns gathered material at the Gilbert & Barker plant, West Springfield, Mass. Burns was no stranger to steel when he visited Gilbert & Barker. While studying at the Art Institute in his native Buffalo, he worked for two years in a Bethlehem Steel plant where he became interested in industrial scenes as subjects for art. His pictures have hung in numerous exhibitions, including the International Watercolor Exhibition at the Art Institute, Chicago, and a one-man show at the American-British Art Center, New York.

STANDARD OIL COMPANY *(NEW JERSEY)*
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.
Published every other month for Employees and Stockholders
EUGENE HOLMAN, *President*
R. W. GALLAGHER, Chairman of the Board
F. W. ABRAMS, ORVILLE HARDEN, J. R. SUMAN, *Vice Presidents*
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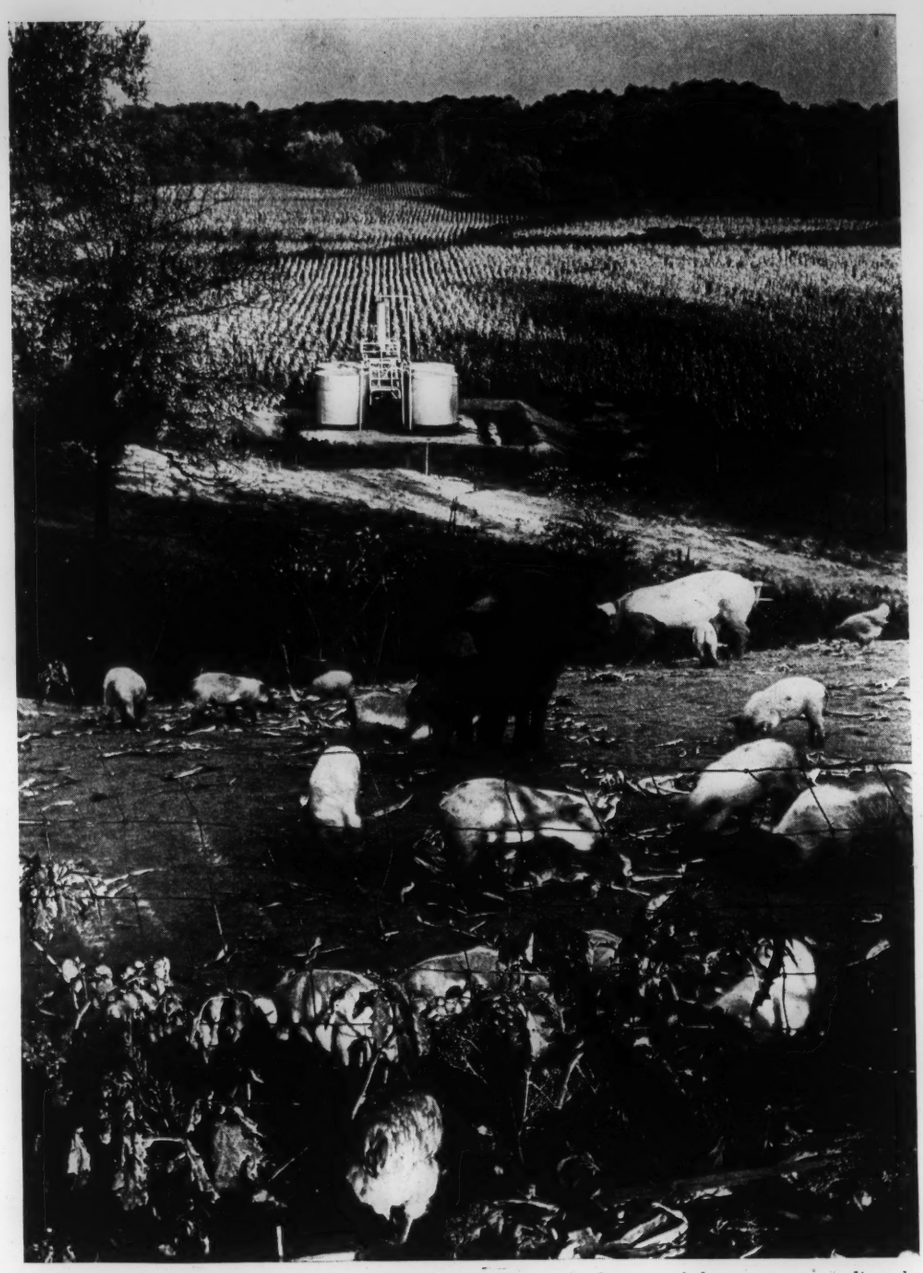


BRINGING WEALTH from underground does not mar the beauty of the country nor disturb farming. Derricks are removed and only battery tanks like these of The Carter Oil Co. remain

New Oil in the OLD SOUTH

Discoveries in new areas stimulate exploration and drilling in states on the South Atlantic Coast

THERE is something new in the old South. The traveler there cannot escape a sense of something stirring, some new awakening. In the towns and cities where men collect and rumors swell, one hears rumblings of an imminent change.

The word is spreading that oil may exist deep under the cotton, corn, tobacco and pine woods. It is bringing to the South the hope of a new source of wealth, and the progress and development which follow important oil discoveries.

The South, from Mississippi around the Gulf Coast to Alabama, Florida and up the eastern seaboard through Georgia, South Carolina, North Carolina, Virginia and Maryland, is one of the last great areas of the country holding as yet undeveloped potentialities for oil. And oil men, from the dozens of large companies to the thousands of small operators, are sending their scouts and geologists, their geophysicists and their giant drills to every one of these states. Landowners, state officials, and residents of cities and towns are watching and hoping.

Geological studies have shown that sedimentary rocks, the kind in which petroleum is found, extend from the known oil regions of Texas, Louisiana and Mississippi through Alabama to Florida and on north past Maryland. But little is known of the character and thickness of such rock in the area along the southern Atlantic seaboard. Nor is it even known whether the conditions necessary to the generation and accumulation of petroleum are present. The geologist looks for three essentials:

(1) The presence of possible source beds, those rocks rich in organic material deposited aeons ago along the shores of ancient seas;

(2) The presence of porous rocks to serve as reservoirs for the oil which may have been formed;

(3) The presence of underground traps in which the oil could have accumulated to form the pools for which man seeks.

The exploratory studies now under way are directed at gathering further evidence on these points.

Test wells are drilled under such conditions as much for the purpose of getting more information on the hidden rock layers as in the hope of striking oil with the first well. For evidence from actual borings must be obtained to supplement the earlier indirect findings of surface geology and geophysical instruments. While a stroke of luck might at any time make one of the early tests the discovery well of a great new oil reserve, the odds are at least ten to one against it.

But within the past four years Mississippi, Alabama and Florida have yielded oil and gas to the probing drills, and these discoveries have opened wide the floodgate of exploration activity.

The new Heidelberg oil field in Mississippi, for example, promises to become one of the nation's large oil pools. Located in an area of small farms and poor land, it has brought new wealth to the landowners and new life to the commu-

nities in the vicinity. Both Negro and white farmers are now receiving royalty checks from oil discoveries on their land and spending them for automobiles, fresh paint and repairs to their homes.

The new wealth is creating new communities and expanding business opportunities in those already established. Further oil discoveries will have an important place in the general economy of the South, which in recent years has reached a new high in industrialization and no longer looks solely to agriculture for its revenue.

In western Alabama, one of the industry's best known and most successful individual operators, H. L. Hunt of Texas, found Alabama's first oil in 1943 and touched off a leasing and exploration campaign by hundreds of operators.

In Florida, Humble Oil & Refining Company, an affiliate of Standard Oil Company (N. J.), found the state's first oil in 1943. The test well, deep in the Everglades and located 700 miles from the nearest known pool, was successful only after a long and discouraging search — adding up to more than a million dollars' worth of effort. The Humble well went down through limestone rocks to nearly 12,000 feet, over two miles, before it made the strike.

The Florida state government had offered a $50,000 cash prize and a free oil lease of 40,000 acres of state-owned land to the company first striking oil there. When the cash was presented, Humble donated it to two Florida colleges.

Other wells are now being drilled in Florida by Humble, and many other operators are active throughout the state. Since, traditionally, oil men swarm to one another's new discovery areas as bees to honey, many more test wells, or "wildcats" as the oil men call them, will undoubtedly be put down.

In Georgia, the Carolinas, Virginia, Maryland and on to the north, the air is charged with excitement which accompanies exploration. While no strike has yet been made in any of these states word of the new wave of search, and the initial successes in other states, has spread.

Exploration by the industry's scientific tools, geophysics and geology, is active throughout these states. The Standard Oil Company of New Jersey has been studying the eastern seaboard intensively and plans a test well in eastern North Carolina which will, even if "dry," provide much needed information on the nature of the hidden rock beds and help in the selection of spots for other tests.

Where this new wave of exploration will lead, at its present stage, is any man's guess. "Oil is where you find it" is a basic tenet of the industry, for the best of modern science is still unable to do more than locate areas favorable for oil; it cannot identify positively a buried deposit in advance of actual test drilling.

The nation needs more oil: now for war and later for peace. Fruitful results of the new activity in the South will be welcomed by the country as a whole, to say nothing of the local residents, the state treasuries, and, of course, the oil operators themselves.

But it would not be surprising if mixed with this anticipation there were some trepidation. The Southerners have considerable pride in the beauty and peace of their section of the country. Some may wonder what the discovery of oil will do to these.

It is difficult for many people to realize that the days of wild oil booms are long gone — gone with the Wild West. The glamorous tradition of the long gone past dies hard, especially when fiction seems wedded to the atmosphere of crowded oil gushers spraying the landscape, the muddy streets of wide-open oil towns, the card sharp and the saloon.

But oil today is a field for skill and science, and attracts dependable men and women who are far better finders of oil than were their grandfathers. Science has brought many changes to techniques of exploration and drilling for oil.

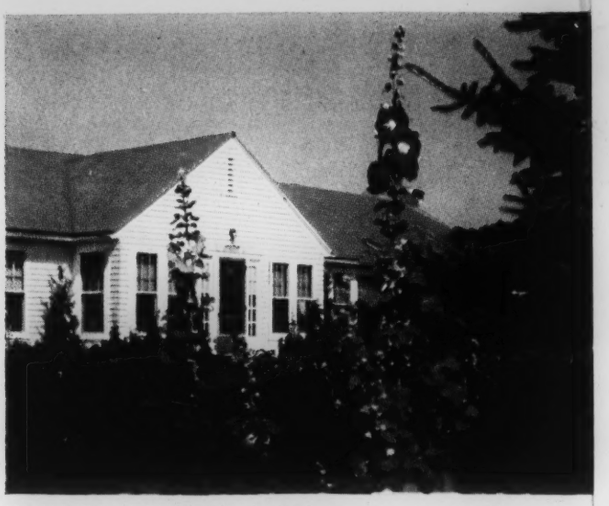
The modern oil industry, if it comes to new sections in the South, will bring excitement, of course, and a boom. But it will be the welcome kind, the kind that accompanies the establishment of any new industry in a small town or city. The oil people coming into the new territory will not come alone but will bring their whole families with them. They will make their homes in the new oil area; their children will go to school; their wives will buy in the stores; these men themselves will take their place in community life as active members of the Rotary, Kiwanis or Lions Clubs. This has long been the experience in communities where oil has already been discovered.

AND strangely enough, the cotton and tobacco, the peanuts and the forests of the older day will not be disturbed. As the farmers of Kansas, Oklahoma, Texas, Illinois and the other oil states have long known, a modern, controlled oil well bears little resemblance to the gushers of old. With the derricks removed when the wells are producing, the few short lengths of pipe above ground are scarcely visible in the fields of growing crops. The farmer continues his plowing and reaping, but with this difference — he now has an underground crop which may yield a return for 20 years and more without worry.

Oil will not change the face of the South; the magnolias, the cotton, the tobacco will still be there. But the added factor of oil will create a new industry in this section which can and very likely will have far-reaching benefits.

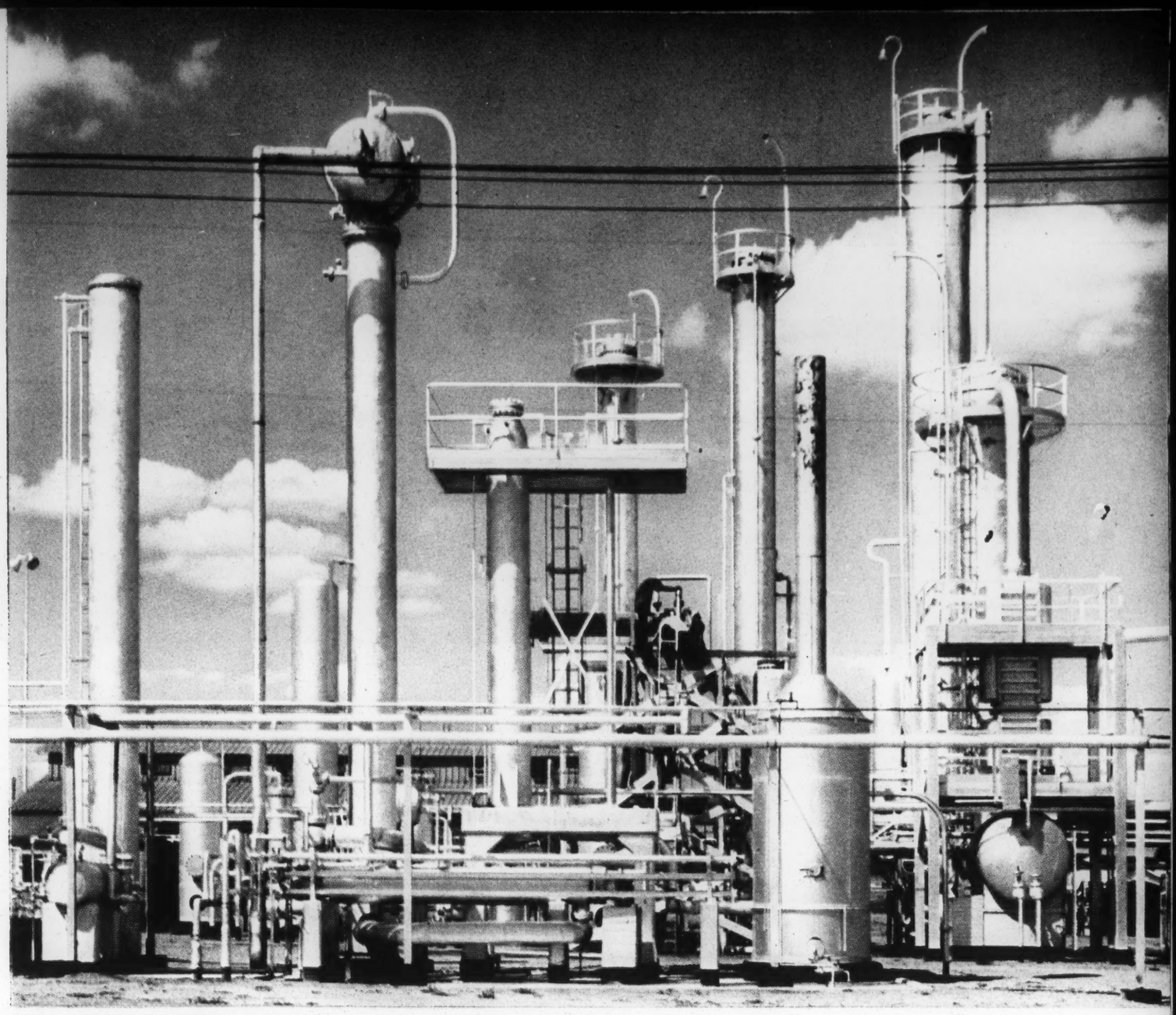
DERRICK OF Humble Oil & Refining Company near Mississippi River above Natchez

CUT BANK, MONTANA, founded in 1910, dates from homestead days. Once a cattle and railroad town, it is now a wheat and oil settlement. This is its "Broadway"



PROFUSE FLOWERS, hollyhocks six feet high, grow in imported soil around Carter refinery office

OIL-DRIVEN COMBINE harvests grain near Cut Bank. Dark patches in background are strips of land left fallow alternate years to keep soil from blowing away



WITH SILVERY TOWERS gleaming in the sun, the fractionation and polymerization equipment at this small Carter refinery is as complex as at the largest ones

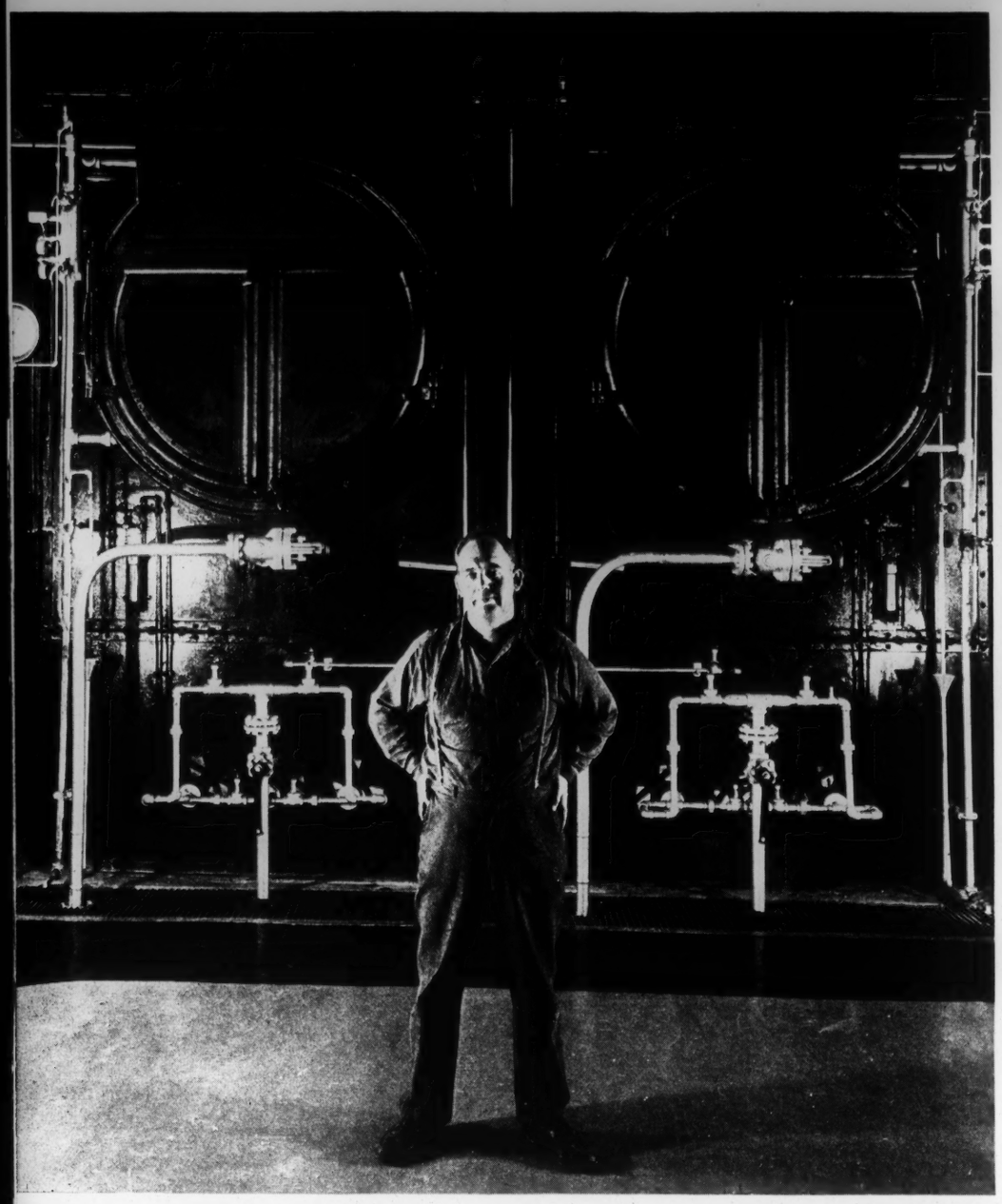
BANDBOX *Refinery*

OUT in the big windswept land of northern Montana stands a Carter Oil Company refinery that looks like a country club. This huge flat stretch, east of the Rockies, has been a cattle and grain country since white men first settled there in the early Nineteen Hundreds. Now it has become an oil country.

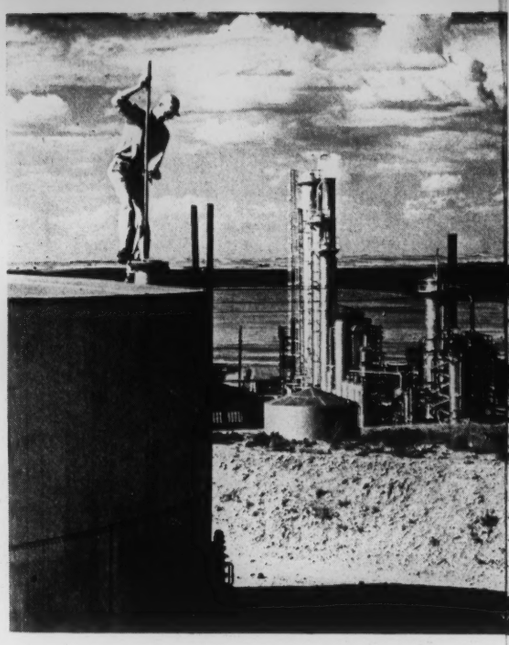
The Cut Bank field is one of the few places left where cable tool drilling is still practiced. Although rotary drilling has been tried there, it was found impractical because scarcity of water increased the cost of this type of operation beyond that of cable tool methods. So the cable tool rigs still pound away, dipping their walking beams in the grain fields. And the farmers clatter past the rigs on tractors and combines driven by fuel refined from the oil under their own ground by the perfect little plant on the hill a mile from town.

The refinery is a neighborhood institution. It is not a big plant, but standing there in this wide land, a lone man-made thing, it looks even smaller. Its three precise towers gleam like new cutlery over the neat blue roofs of its administration buildings. Most astonishing of all are the hollyhocks, and the borders of zinnias and petunias which skirt the perfect lawn, the clipped hedge, and the white clapboard walls of the offices — astonishing because in this country

Shining with neatness and efficiency, it works 24 hours a day for wartime needs



GLEAMING BOILER ROOM at Cut Bank refinery reflects the efficiency of a 24-hour working day. Fireman Carl Anderson is as proud of its appearance as he is of its production



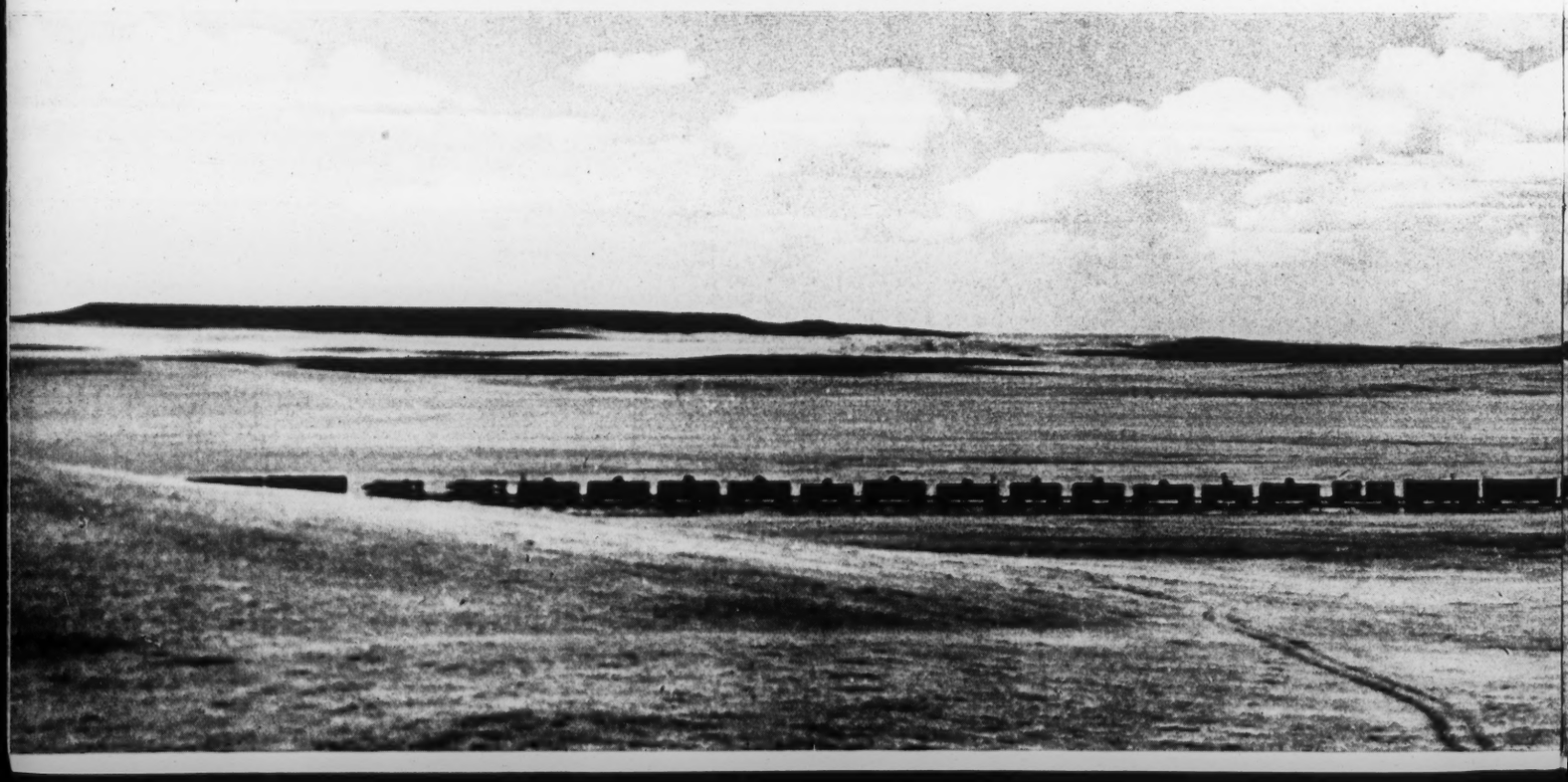
TANK GAUGER, sharply silhouetted on the ground by the bright Montana sun, meas-

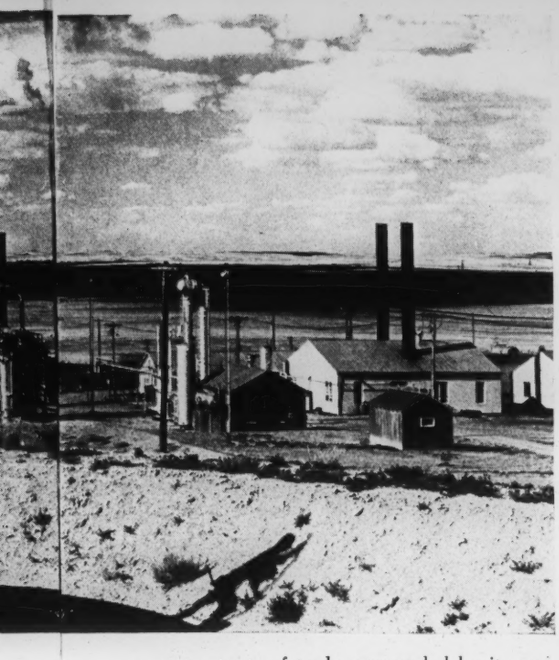
where ordinary trees die of the wind and the cold and the lack of rain, flowers are rare and wonderful. They must be nursed along in soil imported from far away.

The plant itself receives the same lavish care as the lawn, and reflects the feeling of the 30 men who operate it. They take as much pride in it as they would in their own automobile. They keep every inch of it polished and bright. The boiler room floor is like a mirror; the control room shines. Even the compressor room has the cleanliness of a hospital.

Yet this small Carter refinery is no mere show piece. Capacity for capacity and dollar for dollar it is one of the most efficient plants in the United States. It is a

AN OIL TRAIN moves out of Cut Bank across the apparently limitless prairie to



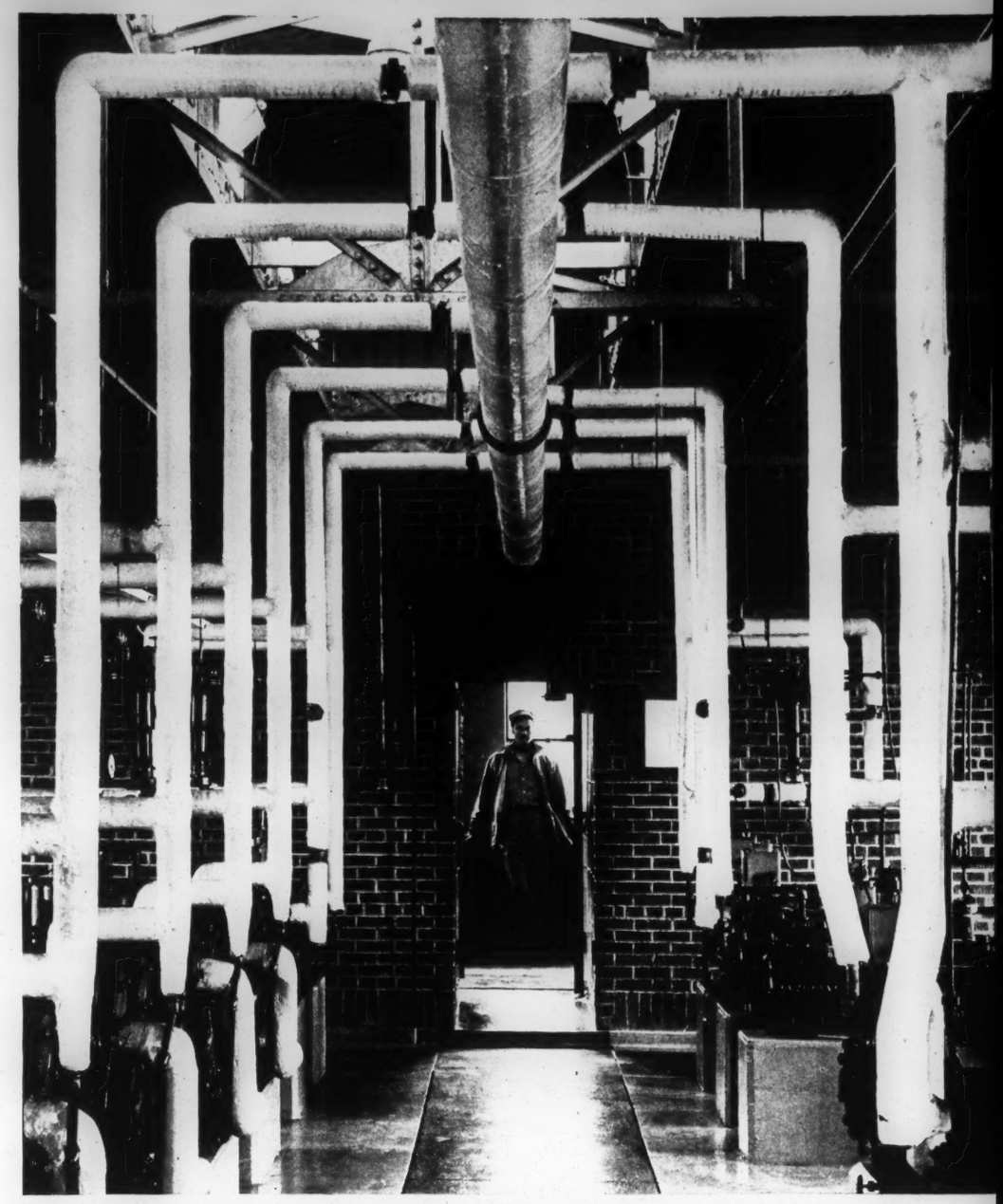


ures contents of tank surrounded by its protective moat. Background shows refinery

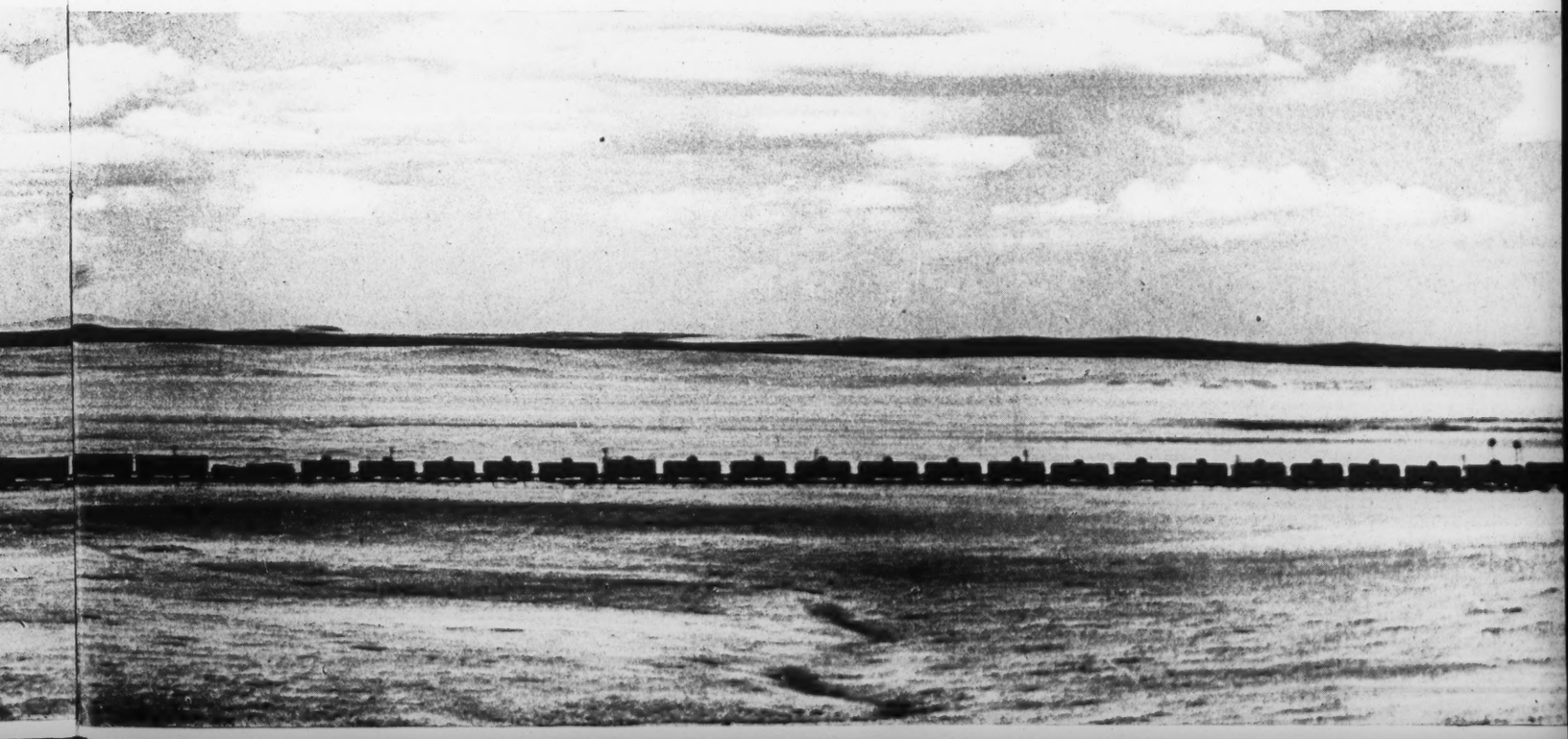
model for its size. During its 24-hour working day it processes some 3,900 barrels. It does a heavy local business in residual oils for fuel. Much of its output goes to fuel the tractors and the trucks and the other machines of the neighboring farmers who are feeding a nation at war. It serves also parts of North and South Dakota, Idaho and Washington.

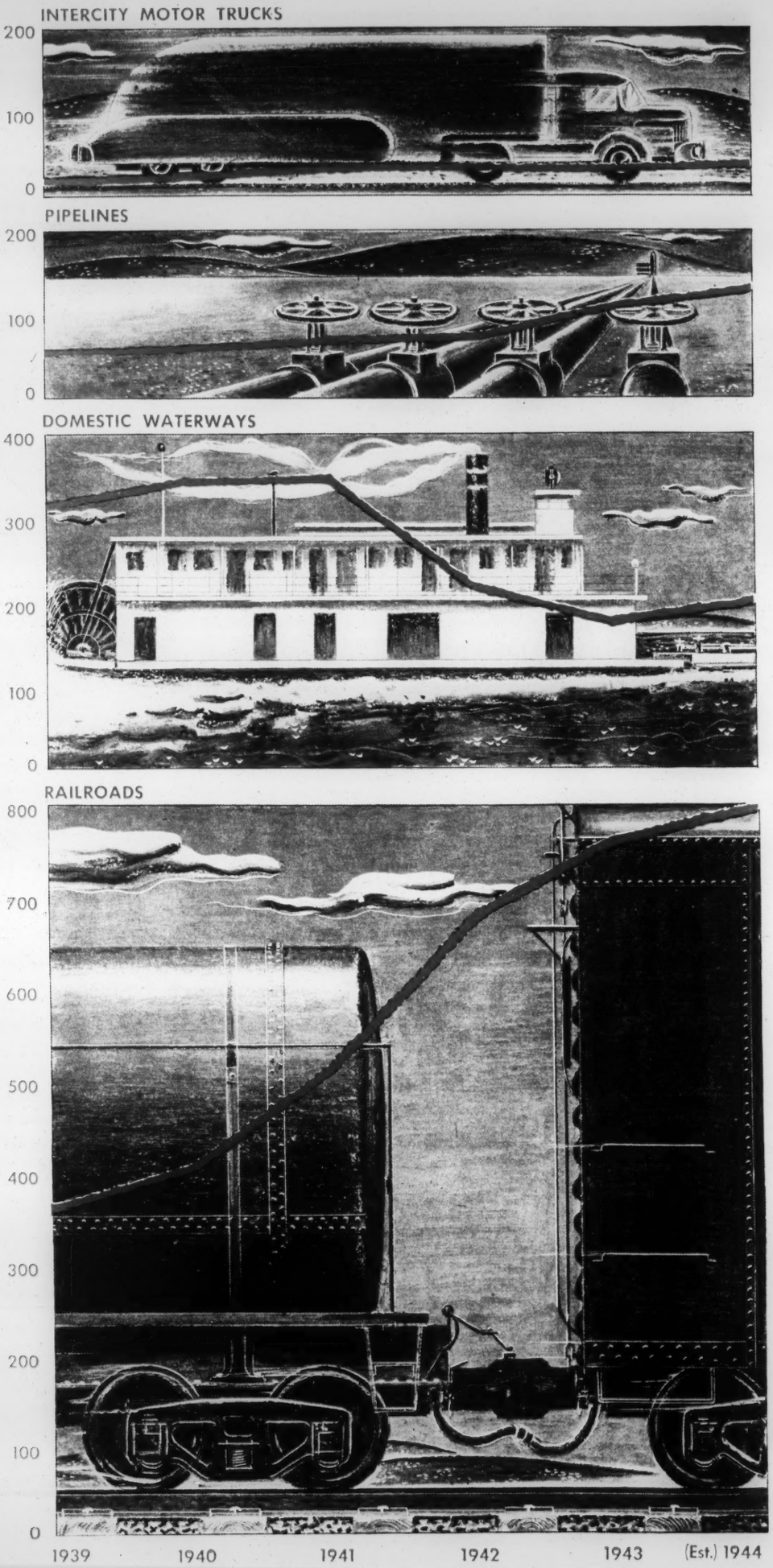
And so, though its yield of finished products is not high, in relation to its equipment and operating cost its record is enviable. As a token of its participation in the war it ships regular consignments of codimer which is used in the manufacture of aviation gasoline bound for distant battlefronts.

haul fuel to the machines of the Western farms which help to feed a nation at war



STEAM SUPPLY PIPES run in an orderly pattern from the main steam line overhead to the pump house, where each pump forces the distillate through a different refining process





HOW AMERICA MOVES

OIL is power, and most oil is used for furnishing power to move people and things. Oil also is a lubricant, and everything on wheels moves on oil. Because of these facts, people in the oil industry pay close attention to trends in transportation. At the present time, especially close scrutiny is being given to the great changes which have taken place in transportation during the war years.

If you move a ton of freight a mile you create what the economists term a "ton-mile." In each of the past three wartime years, the movements of commercial freight in the United States topped the trillion ton-mile mark. In 1944, they are estimated to have reached almost one trillion two hundred billion ton-miles, compared with three-quarters of a trillion in 1939.

If you move yourself a mile, you create a "passenger-mile." No people in all history have done so much traveling across the face of the planet as modern-day Americans. Last year, Americans in intercity transportation traveled more than one hundred billion passenger-miles.

FREIGHT TRAFFIC has been growing to the greatest extent on the railroads. Before the war, operations of the railroads accounted for about five out of every ten ton-miles of the country's commercial freight. In 1944, almost seven out of every ten ton-miles, or 800 billions, were carried by rail. It is interesting to note that last year railroad ton-mileage was more than the total of all types in 1939, the year the war started in Europe. The railroads have been able to carry the tremendously greater tonnages of this war by increasing the load per car and by running cars more miles per day. In fact, the average freight car now is hauled twice as far per day as at the beginning of the first World War.

The railroads began, in 1942, to transport millions of additional tons of petroleum, which had been carried by coastwise tankers until the submarine menace and the need for tankers on global routes curtailed shipments. No data are available for 1944 but crude oil shipments originated by rail rocketed from seven million tons in

1941 to 25 million in 1943, and all petroleum shipments reached a total of 85 million tons.

Inland waterways follow railroads in the amount of freight carried. River and canal lines are estimated to have hauled one-sixth of all U. S. commercial freight traffic in 1944, or 200 billion ton-miles. However, inland waterways are the only form of transportation to lose ground during the war. This compares with a peak of 350 billion ton-miles in 1941.

Oil pipelines stand No. 3 among freight carriers, and in 1944 handled about one in every nine tons of commercial freight.

Use of the oil pipelines increased from 63 billion ton-miles in 1939, to almost 140 billion last year.

Intercity motor trucks hauled approximately 37 billion ton-miles of freight in 1944, or about one out of every 30 tons of intercity commercial freight in the country. At the end of 1944 there were an estimated four and one-third million civilian trucks registered in the U. S., a drop of about half a million since Pearl Harbor. In addition to other demands, trucks had the job of linking thousands of prime war contractors and sub-contractors, and in serving the approximately 50,000 communities which have no railroad facilities.

The express and mail which are carried by airlines are vitally important to the nation, but do not bulk large in ton-mile figures. Airplanes handled about six-thousandths of one per cent of America's freight ton-mileage last year.

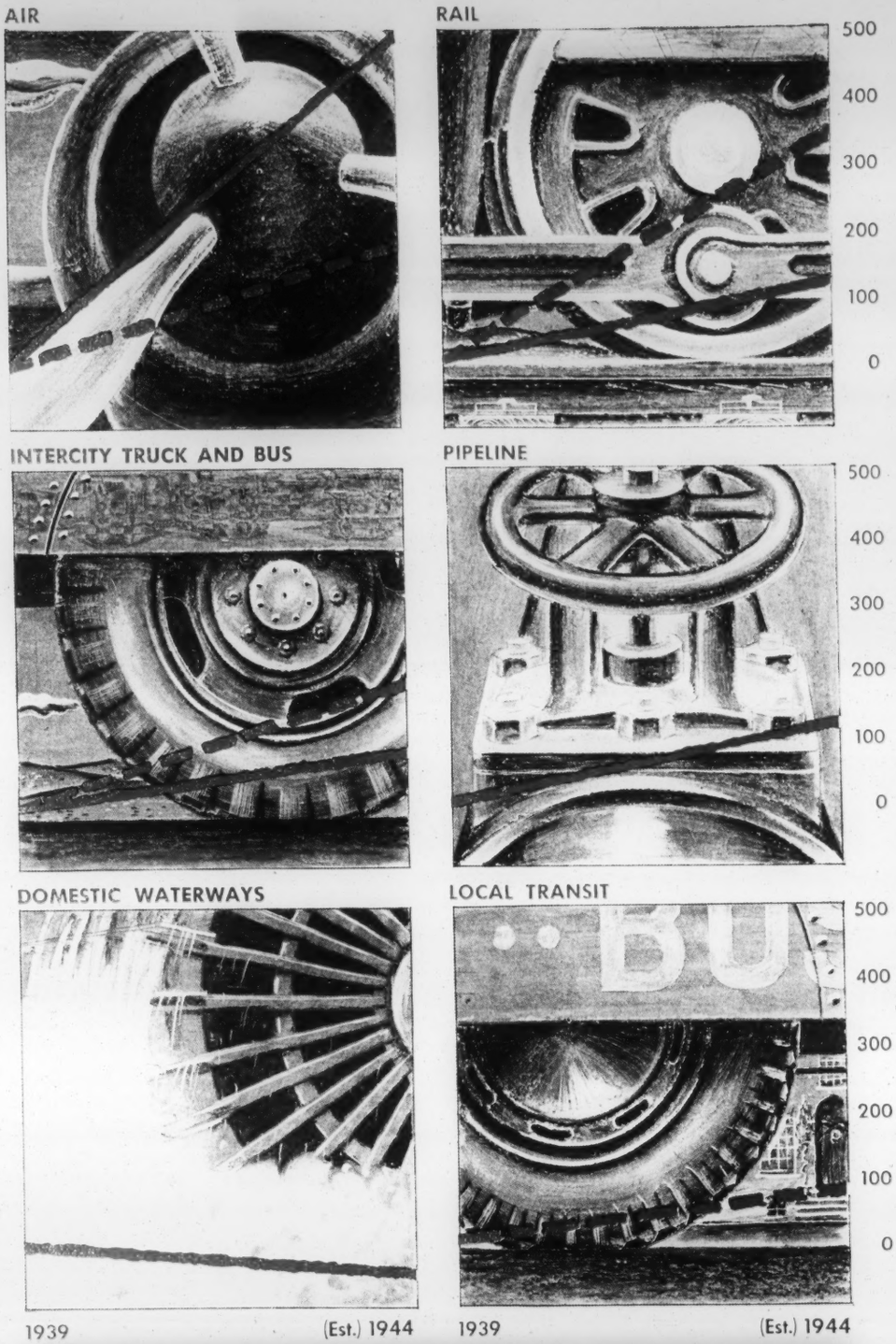
PASSENGER TRAVEL in recent years has zoomed up at a faster rate even than freight shipments. For every mile of intercity travel covered by Americans in 1939, they went almost three miles in 1944.

The biggest share of the increase in passenger traffic has been borne by the railroads. In 1944, it is estimated there were considerably more passenger-miles (100 billion) accredited to the railroads than in 1939 and in the peak year of the first World War combined.

Motorbus lines between cities have been besieged by passengers — war workers, servicemen and their families, and the public at large. Last year it is estimated that they carried more than twice as much passenger traffic as in 1941.

Local transit lines, coping with the massive expansion of employment in war industries, saw their patronage in 1944 rise to a figure more than one and one-half times the level of 1941.

The airlines, handicapped by the armed services' requisitioning of a considerable number of their planes, still were able to increase passenger traffic in 1944 by more than one-third over the year 1941.



The U.S. transportation picture: 1939-1944

Billions of ton-miles of commercial freight hauled by America's principal intercity transportation systems year by year since 1939 are indicated by the red lines (left). The railroads last year attained a greater number of ton-miles than did all U.S. transportation systems combined in 1939, the year World War II started.

Percentage changes in traffic in the span from 1939 to 1944 are indicated by the red diagonals (above): dashed lines for passengers and solid lines for freight. The greatest percentage increases in passenger traffic were registered by railroads, and in freight by airlines.

ANGLE OF A MILLING FORM CUTTER is studied by Edward Purchase, foreman of the Gilbarco tool room, and Clifton French, his assistant. These form cutters must be highly accurate

1/20th of a HAIRSBREADTH

Gun parts made by Gilbarco must be true to within two ten-thousandths of an inch

THIS LITTLE JEWEL of machinery is one of the delicate mechanisms whose assembly calls for skills as delicate as a watchmaker's

THE old wooden navies were beginning to give way to armor-clads which housed their smooth-bore guns in revolving armored turrets when the firm of Gilbert & Barker was born in a little wooden shop at Springfield, Mass., in 1865.

Now that the little shop of 1865 has expanded to 18 acres and has become the largest factory of its kind in the world, it has put 75 years of civilian production behind it and turned for the first time in its history to the making of fire control equipment for such naval turrets as were never dreamed of in 1865. The turret crews of that heroic day did little more than sight along the barrel to find the target, but the elevation and bearing of turret guns today is determined with the assistance of tons of the most accurate precision mechanisms.

The wooden navies were using the great-grandfather of all torpedoes in 1865. This was an awkward gadget which consisted of a long pole with an explosive charge fixed to the end of it. Having no motive power of its own, it had to be rowed to its target, plunged under water and exploded electrically as soon as it was placed in position against the enemy's hull.

Gilbert & Barker was then beginning to manufacture some of the pioneer machines for lighting and heating with gasoline. But today the big Springfield factory is making steering engines, little jewels of machinery done with a watchmaker's precision, for the self-propelling torpedoes of the modern navy. The old spar torpedo of 1865 would hardly recognize as its lineal offspring these modern 40-knot wonders.

In 1865, bird shooting was one of the leading sports of the country and was about as close as our grandfathers came to the miracles of modern anti-aircraft fire. The modern A-A gunner uses a refinement of the same techniques in hitting targets which move at heights up to seven or eight miles and swerve and dive at speeds up to 500 feet a second. To bring them down, or at least to break up their bombing runs, he has to solve intricate problems of calculus, he has to transmit the solutions to the gun, he has to swing the gun barrel for elevation and azimuth, and the whole process has to be both instantaneous and continuous, so that the gun muzzle automatically follows its targets across the sky. This is far more than the limited human eye and brain can do. It has instead to be done by the most delicate machinery.

Gilbert & Barker has never had anything to do with bird hunters and their wants. Down to 1939, the Springfield factory was producing the gasoline pumps, domestic oil burners, and industrial oil furnaces which have made the name "Gilbarco" known throughout the world. But today it is making fuse setters for A-A shells, a device which thinks in tenths of a second.

It is making indicator regulators which transmit the electrical impulses from the director to the gun with an accuracy extending to minute fractions of a degree. It is making oil gears so exact that when the valve moves as little as one five-hundredth of an inch—a distance one-sixth the thickness of a piece of paper—even that infinitesimal movement results in movement of the gun barrel.

IT is making other equipment for the Army and Navy, most of it calling for a high degree of precision work in its manufacture. In its normal peacetime work before the war, the factory dealt in measurements which were accurate to a thousandth of an inch. Today some of its ordnance parts have to be accurate within five-tenths of a thousandth of an inch, and some are held to two-tenths. A hairsbreadth is sometimes regarded as the acme of fine measurement, but actually it is 20 times as big as two-tenths of a thousandth of an inch. It is never used in really close work of this kind. A part which was out of measurement by a margin as tremendous as a hairsbreadth would never even be submitted to the Army and Navy inspectors at the factory.

Such work may be described as "precision work" with no apology at all for the use of that much abused term. It calls for a highly skilled type of workman. To meet the ordnance contracts for which its first re-tooling was begun in 1939, the factory had to solve the apparently insoluble problem of greatly increasing its skilled force at a time when the draft was about to take many of the men who were already on its payroll.

This was a hurdle which could not have been cleared everywhere in the country, but Springfield has an old tradition of skilled workmanship. Its government arsenal dates back to 1777. Its armory (1794) made the famous Springfield musket during the Civil War. It is still the Army's principal small arms factory, and the town is full of craftsmen who are accustomed to meeting fine tolerances.

Gilbert & Barker has always belonged to the Springfield area and has always had its full share of the area's skilled workmen. Thanks to the labor policies of Standard Oil Company (N. J.), to whose group Gilbert & Barker has belonged since 1884, the factory still had a core of skilled over-age men left when the draft had finished its comb-out.

To expand this nucleus, an offer was made to train new workers in the reading of blueprints and in on-the-job and in-the-shop duties. The response came from every corner of the Springfield area. Doctors and lawyers cut short their office hours in order to work the rest of the day and part of the night on war production. White collar men and manual workers helped to swell the new labor force during the peak employment period of October 1942. The total of employment at the factory today

is nearly 2,400.

Housewives and girls who had previously been employed in department stores or in offices are now wearing slacks or coveralls in the workrooms of Gilbert & Barker. A number are used in inspection work. One of them, for example, sits before a small switchboard, feeding ships' speeds and courses and the wind's velocity and direction into a naval sight assembly, and taking from it the correct gun elevation and bearing.

ANOTHER woman, with a son in the Army, applies her electric gauge to a pilot sleeve for an oil gear and finds it "half a tenth" off measurement before she resumes honing it. "Half a tenth" in shop language means a half of one ten-thousandth of an inch. There is no heavy work in any of this. But both in inspection and in actual manufacture, there is need of fingertips with the natural aptitude for the handling of fine machinery which is part of the Springfield tradition.

The factory began changing over from its normal range of peacetime products to secret equipment for the Army and Navy in 1939, well back in the "defense" period. It was evident from the first that Gilbert & Barker could make its greatest contribution to the defense program by the production of high quality war material, and the bulk of its war work accordingly has been the production of fire control and sighting equipment for anti-aircraft and naval guns. This was a bold departure, for some of the naval equipment ordered had never been manufactured outside naval gun factories before, and anti-aircraft fire control mechanisms were new to the United States, their designs having been either imported or recently created at the government arsenals.

Once started, the volume of war work swelled rapidly, and by 1942 it virtually monopolized production. The annual payroll had then increased from a prewar average of $2,625,000 to approximately $7,000,000.

Today, visitors who pass the guarded outer gates of the factory find that the gasoline pumps and oil burners of peacetime have been pushed aside. When peace returns, they will come back into production, even better than they were, for the high quality precision work now being done will leave behind it new skills and new techniques. But for the present they stand inconspicuously in corners out of the way.

Far more conspicuous now is a 40 mm. anti-aircraft gun which stands, fully assembled from its rubber tires to the flash cone on its muzzle, on one of the factory floors. Also new and dominant today are the tall yellow check targets at which Army and Navy inspectors test newly produced fire control equipment by sighting it on small red and black circles. They wear civilian clothes, but their decisions are law nevertheless.

OVER the "Gilbarco" plant flies an Army-Navy "E" flag which was raised in front of the factory offices on July 27, 1942. It was awarded for outstanding achievement in the production of war materiel. Today there are four white stars upon that flag in recognition of five consecutive Army-Navy "E" awards. The fourth star was added only a month ago.

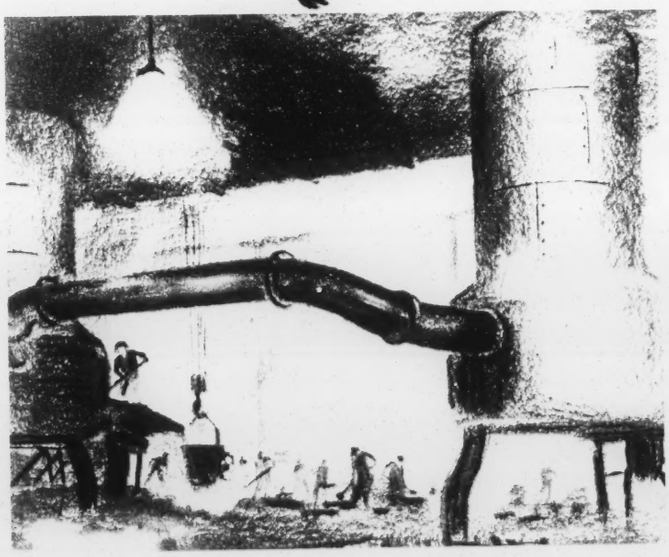
Around these unmistakable evidences of war production, the machine shops are remarkably quiet. There is little more than a hum of many voices on the crowded floors. No need to converse by shouting where precision work is under way. Men who are fabricating torpedo steering engines under magnifying glasses are apt to work in silence. They work to tolerances which cannot be measured. The parts of a delicate little engine, which must operate on a fraction of an ounce of pressure, must fit so closely that the final lapping of the steel valve stems is done with crocus, a red iron oxide, on tissue paper—and a little crocus rubbed between thumb and finger seems no more abrasive than fine cold cream. The fits, in brief, must be perfection. Nothing less will do.

And yet for all the quiet, Gilbert & Barker is today one of the largest producers of anti-aircraft and naval sighting equipment in the country. In the manufacture of these extremely high quality mechanisms, the Springfield factory is part of our American arsenal of democracy. The thought of that vast arsenal and its incalculable meaning to the Allied cause must have been one of the things which prompted Winston Churchill's statement of a few weeks ago: "When we see that in three or four years the United States has in sober fact become the greatest military, naval and air power in the world—that I say to you in this time of war is a subject for profound thanksgiving."

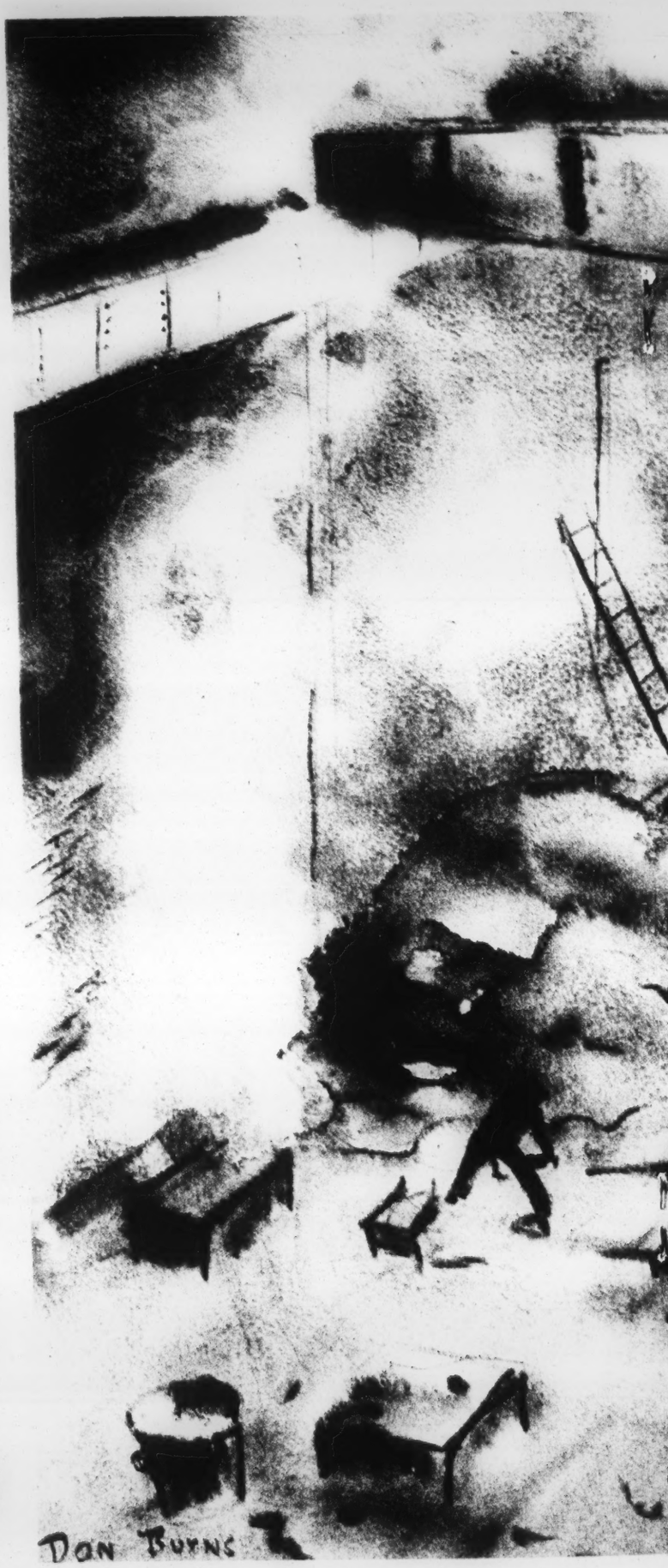
THREE TEN-THOUSANDTHS of an inch is the tolerance to which this ordnance part has to be machined to insure the alignment of the ball bearings later to be assembled in the case

SOME TEN PER CENT of Gilbert & Barker people who do precision work on fire control equipment for Army and Navy guns are women. Many are housewives without previous mechanical experience

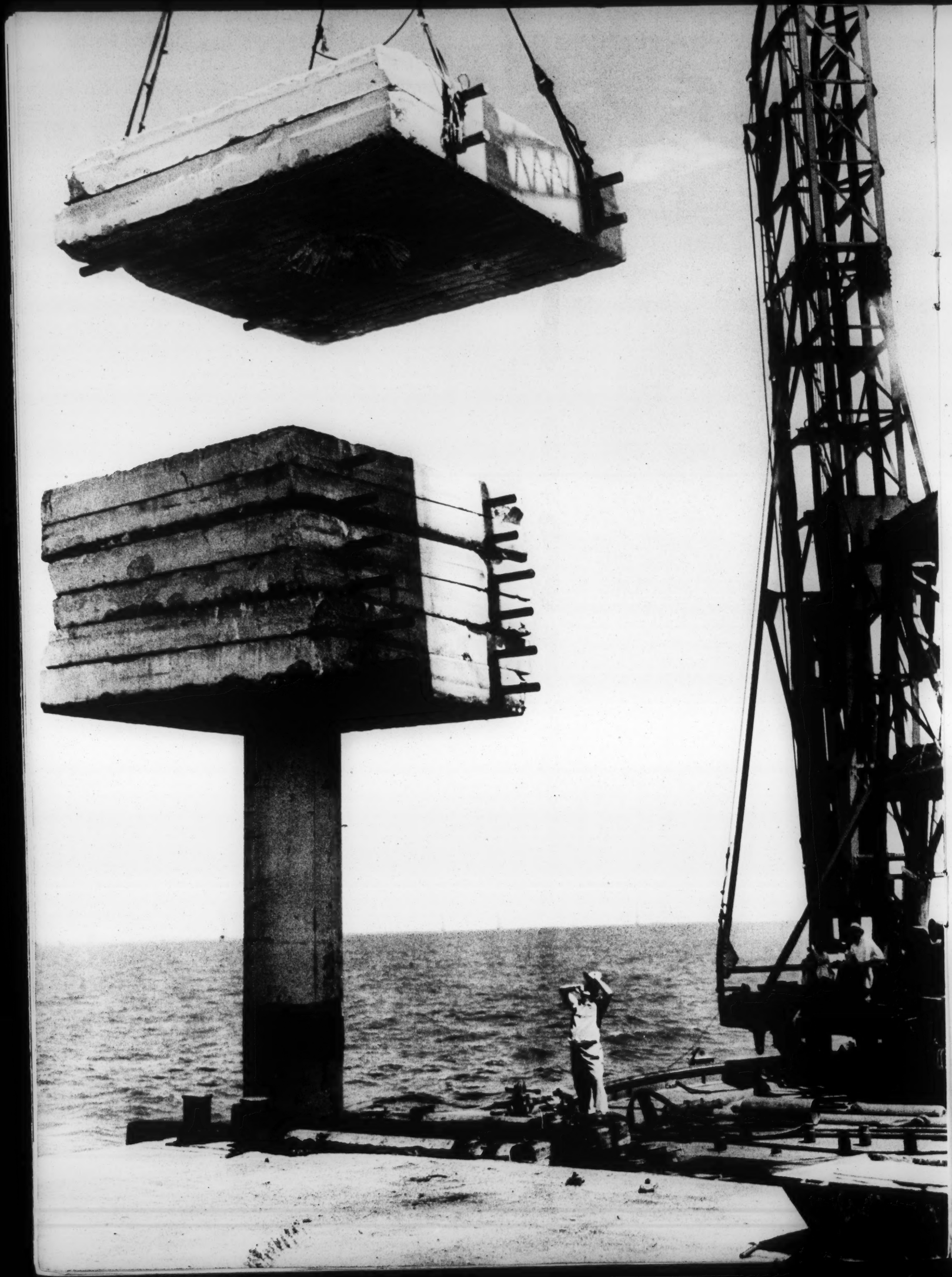
IN GRINDING ROOM, used for first rough finishing, huge dust conduits in the glare resemble roots of some giant tropical tree



MELTING FURNACES, showing (at the left) molten iron flowing into a ladle, make superior gray iron of varying compositions



GILBERT & BARKER FOUNDRY — a smoky scene, with molds, cranes and furiously working men all weirdly highlighted by the glare of the flame — is the initial matrix for finished precision instruments. It made the most dramatic appeal to artist Don Burns



VENEZUELA

Oil for the Allies is produced by skilled nationals trained by Creole Petroleum Corporation

MILLIONS of barrels of Venezuelan oil for the Allies are being produced today by trained and capable Venezuelan nationals, who but a few years ago were without mechanical skills and experience. It is their contribution to the war for freedom from the land of Simon Bolivar, liberator of six nations.

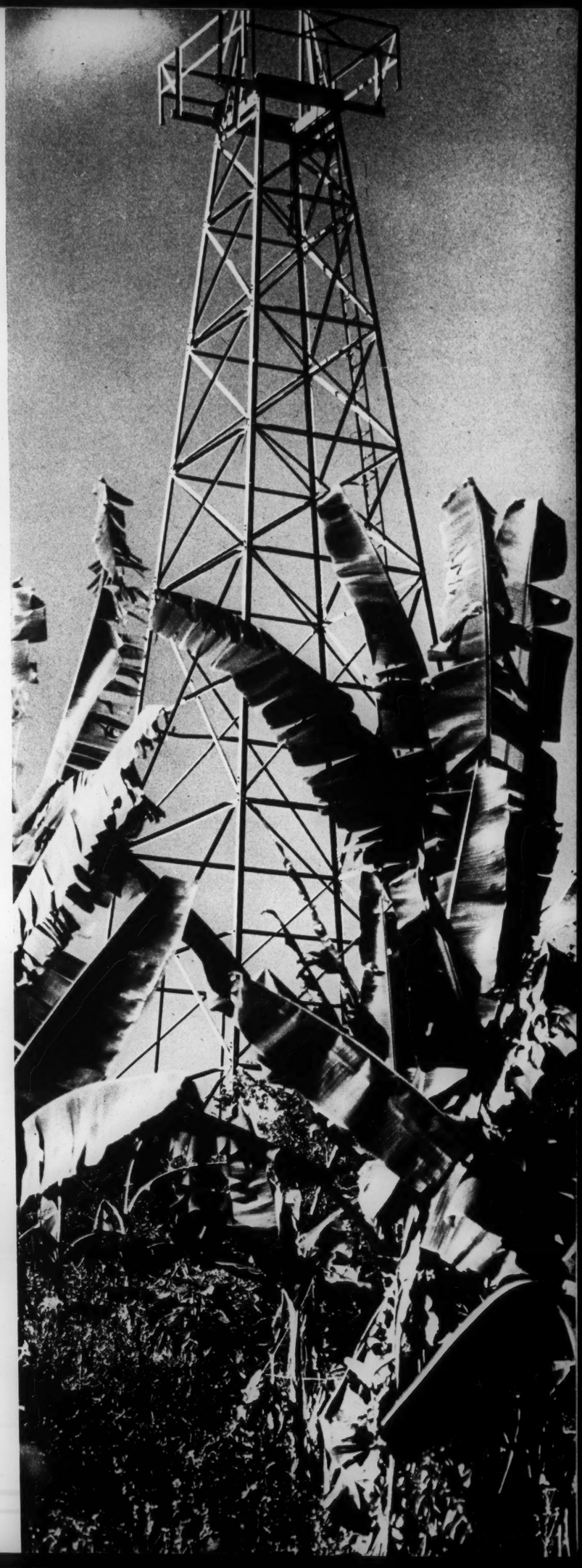
Training and education carried on by the oil companies over two decades has brought Venezuelans into the most highly specialized and skilled oil industry jobs in their native land.

They are directing crews as new wells are drilled; they are in charge of transportation of oil by pipeline and tanker; they are working as geologists, technicians, electricians, welders, mechanics, truckmen and caterpillar tractor operators.

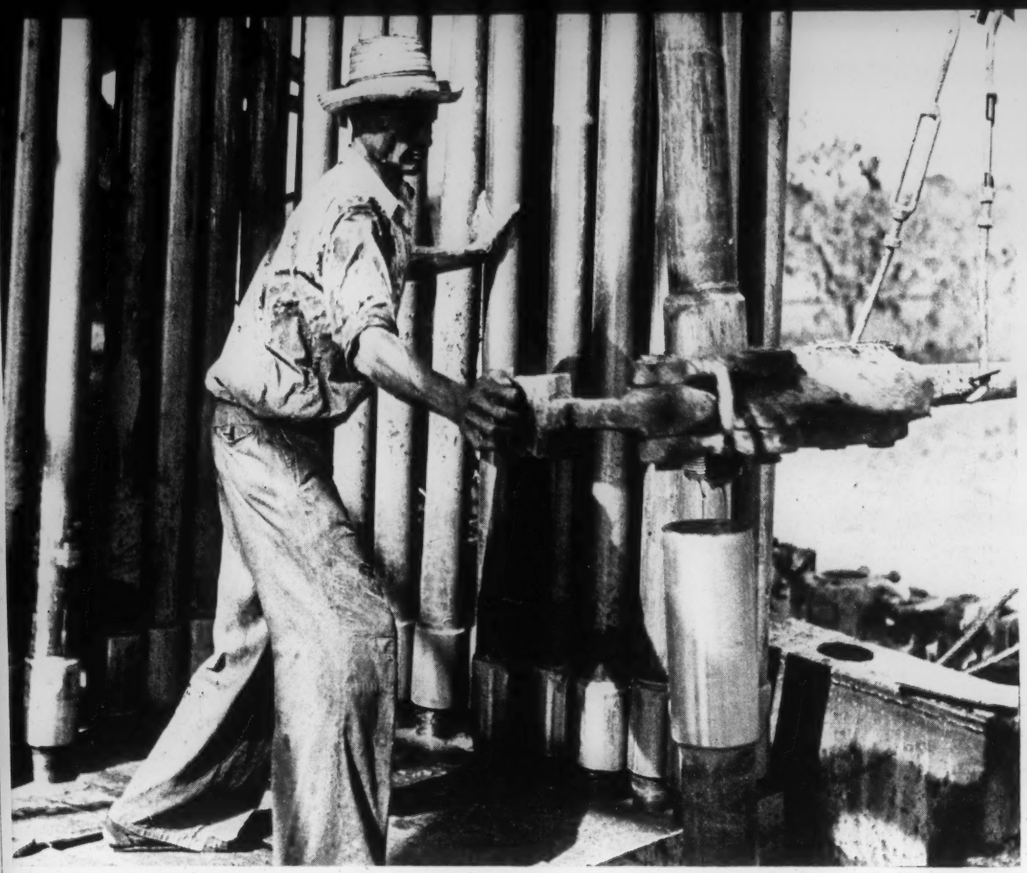
Creole Petroleum Corporation, a subsidiary of Standard Oil Company (N. J.), produced about 415,000 barrels of crude oil a day, or more than 50 per cent of the total daily Venezuelan production of about 765,000 barrels during the last quarter of 1944. And the hundreds of Venezuelans employed by Creole had a major part in this production.

Venezuelans also are working at specialized tasks in the refineries at Caripito and La Salina. They are operators and are trained as foremen and for higher supervisory positions.

Crude oils from Venezuela are valuable sources of special petroleum products for war, some being extremely important for



FOUR 50-TON WEIGHTS, placed by floating derrick (left), sink caisson over 150 feet long into bed of Lake Maracaibo through 100 feet of water. Four such caissons, supporting oil derrick over water, form the foundation for underwater drilling. Above is a Venezuelan oil worker; right, derrick above a well in eastern Venezuelan jungle



COMING OUT in 90-foot lengths, the pipe is pulled from the well to change the drilling bit, and this skilled Venezuelan worker is releasing the tongs after having "broken" a joint

NATIONALS are serving as chemists for Creole. Here one is busy in the petroleum en-

high octane base stocks for aviation gasoline and others yielding a large percentage of prime quality diesel fuels for ships of the merchant fleet and the Navy.

From the Caripito refinery, with a capacity of 38,000 barrels of crude a day, comes gasoline leaded to 70 octane, kerosene, light and heavy bunker fuel oils, and special light cuts made for finishing at other Caribbean refineries to augment production of aviation gasoline. Naphtha, kerosene, light diesel and fuel oils, gasoline, and an asphalt base which is blended with heavy naphtha diluent to produce asphalt cutback, come from the La Salina operations with a capacity of about 8,000 barrels of crude a day.

The greatest part of Venezuelan production is exported, with Europe and other South American countries constituting the principal peacetime markets for products, and the United States importing the lighter paraffin-base crudes to supplement its own wax supply. Today most of the Venezuelan oil goes to the Allies.

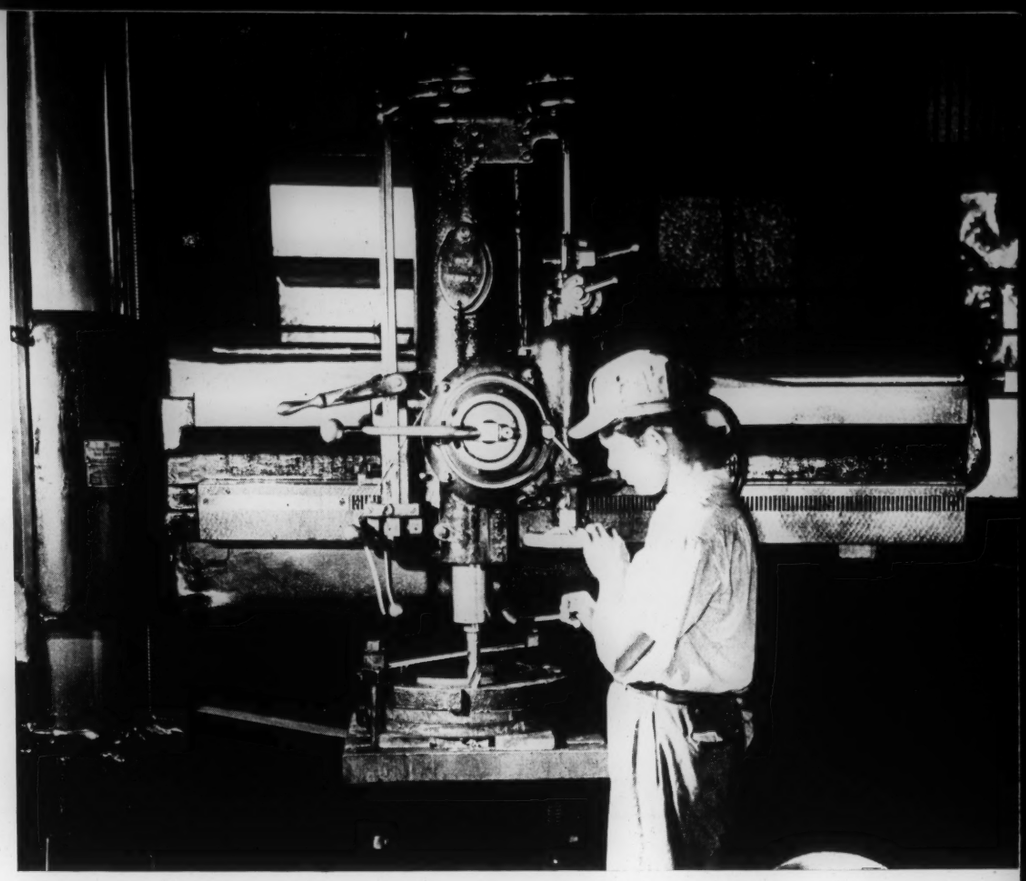
Not all of the output goes for war use, however. Creole supplies a large portion of the petroleum products used in Venezuela, and the asphalt it produces is being used in the country's highway and airport construction program, while kerosene is increasingly popular with the nationals for lighting and cooking purposes.

While Venezuelan nationals are currently performing specialized tasks in the oil industry, this was not the case, due to

OPERATOR of this Venezuelan service station is a national who sells articles well known to motorists in United States. The expanding highway system will call for many new stations

CHECKING CORE samples brought from far below the earth's surface is done in the

gineering laboratory the company operates at Caripito, in eastern Venezuela's oil fields



SKILLED MACHINIST trained by Creole is operating a drill press in the machine shop at La Salina. Here the company has one of its refineries near the great Lake Maracaibo oil fields

the country's predominantly agricultural background, when North American oil interests first entered the country about 20 years ago. The cooperation of the Venezuelans and the oil men who contributed their "know-how" have brought about development of Venezuela's present group of skilled oil workers.

Creole, in developing these technicians from the local labor supply, instituted programs much like those with which the United States has met the war emergency, by preparing untrained adults without mechanical experience for jobs in the nation's highly specialized war industries.

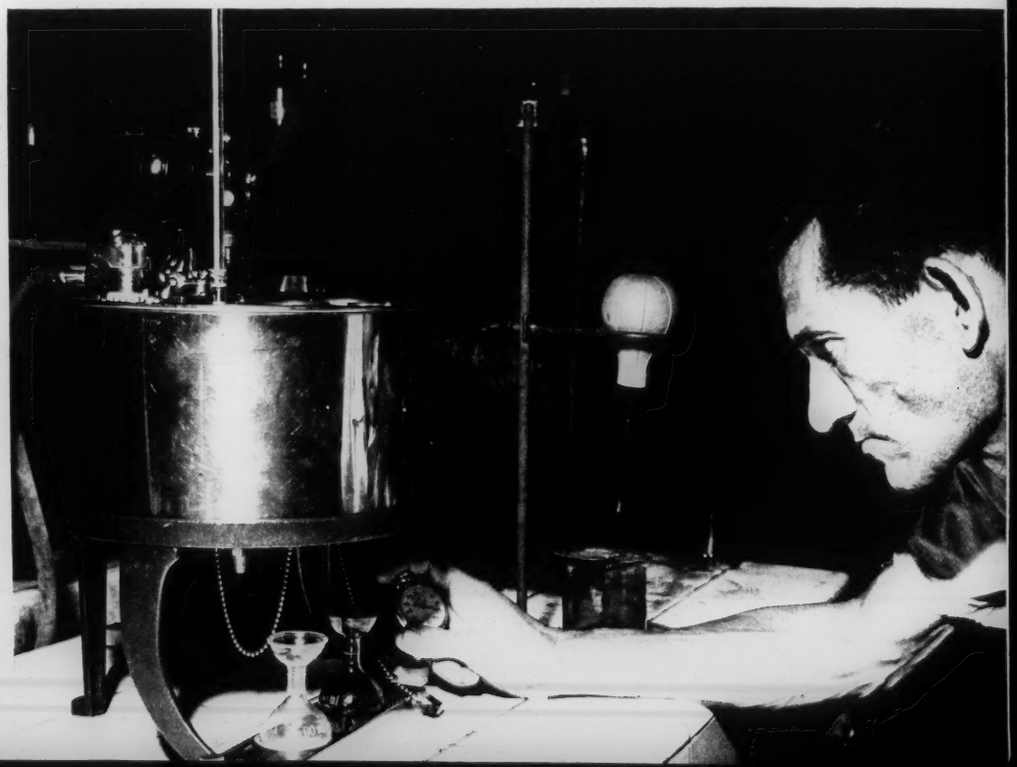
When the oil camps were first opened, instruction was given the nationals by welders and mechanics brought from the United States. Later, classrooms and manual training shops were opened, and today, long, rambling stucco school buildings are both centers of education and of community life in the oil camps. Through lectures, shop instruction and experience the Venezuelans have become adept at a number of mechanical skills.

The schools, built and operated by Creole, are used during the day by the children and at night by their fathers and older brothers.

The children are taught grammar school subjects and manual arts through the sixth grade. They also work small demonstration gardens under direction of instructors, for particular stress is placed on scientific agricultural methods to fit the

La Salina laboratory by geologist, using his tongue for a quick salt-content test

TESTING viscosity, this technician in the petroleum laboratory at La Salina is shown with a stop watch checking the flow rate of lubricating oil through a Saybolt instrument



student for farming should he decide to stay on the land instead of becoming an oil company worker.

But Creole does more than provide schools for children and adults. It awards scholarships to Venezuelan institutions such as the Caracas Nursing School, Caracas Teachers Normal School, Maracaibo Nautical School, and the Geological Institute of the Central University of Caracas.

Other scholarships are awarded so that Venezuelan students may attend colleges and universities in the United States for advanced courses in engineering, medicine, agriculture, geology or other special subjects.

Creole pays transportation to and from the United States and provides funds for board, lodging and university fees. The engineering students are offered summer jobs in the United States oil fields to gain practical experience, and are hired by Creole as junior engineers when their courses are completed.

The program goes beyond schooling and employee training. Modern houses, hospital and dispensary facilities and recreation programs are provided as part of the company's over-all plan.

The company hospitals and dispensaries are maintained for the workers and their families, and are staffed by Venezuelan nationals serving as physicians, surgeons, dentists, nurses and laboratory technicians.

Malaria and tropical disease constitute the principal health problem, and the company conducts malaria clinics and mosquito eradication projects, which have been successful in reducing malaria materially in the oil communities.

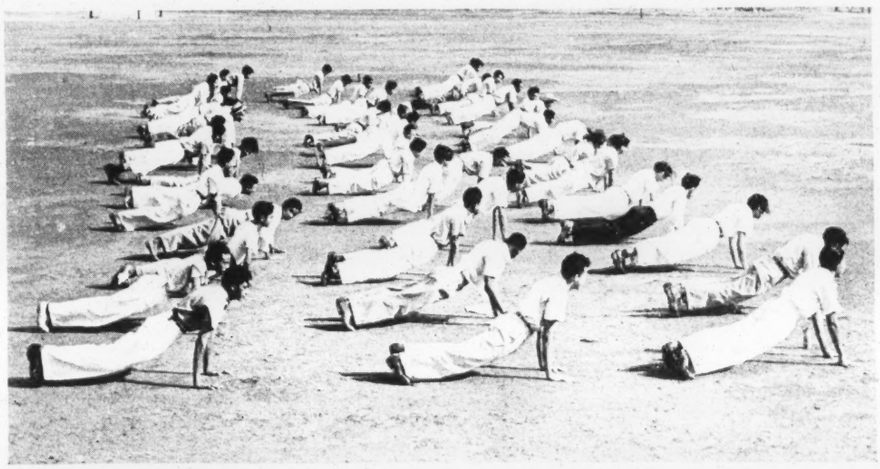
To implement further its health and sanitation program, the company builds water purification plants, lays miles of water mains to bring pure water to the oil workers, and has installed extensive sewer systems.

Houses of brick or hollow tile have been built for the employees. They have modern kitchens and bathrooms, and are provided at nominal rental.

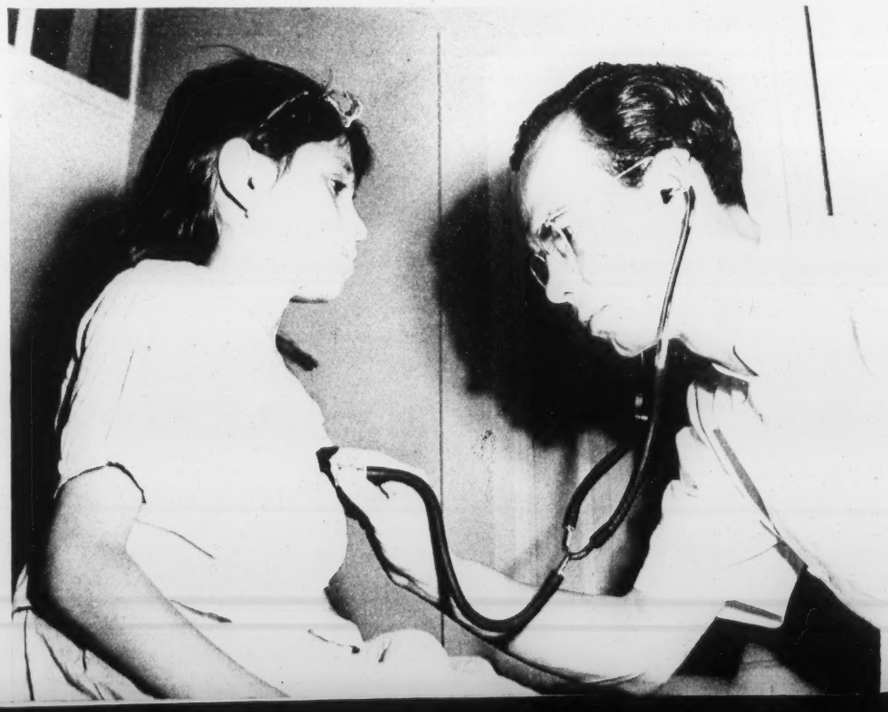
Recreational facilities also are provided for the leisure hours of the workers and their families, and Venezuelans take full advantage of the tennis and basketball courts and baseball diamonds. Billiards, cards and motion pictures also are popular and the clubhouses usually are well filled after working hours.

Classroom and shop instruction, card rooms and baseball diamonds, houses and hospitals and oil production go together in Venezuela. They have played a big part in Creole's production for they have all served to develop the skill and leadership of hundreds of Venezuelans producing the oil so essential for the fighting forces of the United Nations.

PRIMARY EDUCATION class for Venezuelan nationals working for Creole is held in the marine repair shop after working hours. Many of the workers with little or no formal education take advantage of this opportunity to master the three R's during the evening hours



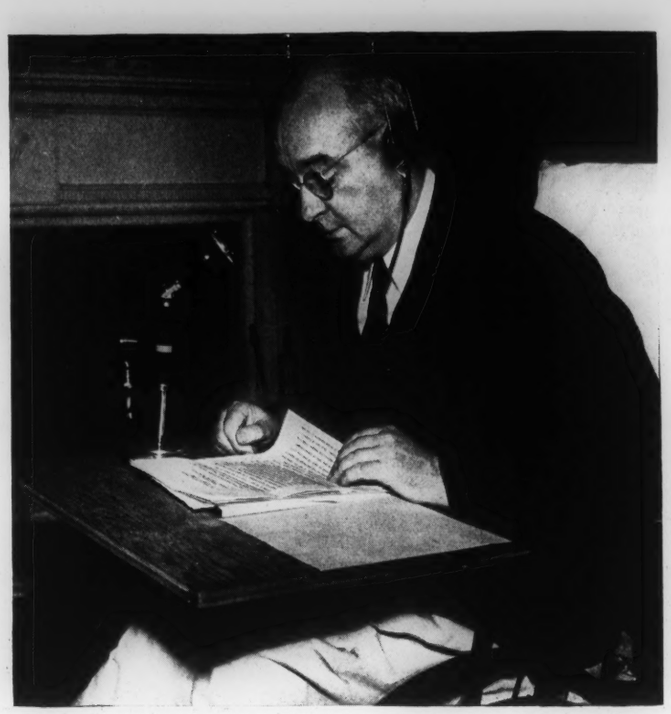
PLANNED RECREATION is part of the oil company's program and here boys do mass calisthenics at Concordia School, near Lake Maracaibo. Below, a Venezuelan physician in La Salina clinic examines a child as part of the health program for workers and their families



MODERN SCHOOLS built and operated by Creole for the oil communities are used by children during the day and adults at night. Here pupils are shown leaving the company's Concordia school

HOUSING PROJECTS provide modern homes for the oil company workers at reasonable rentals, with free gas, water and electricity furnished. The houses below are in Caripito in eastern Venezuela.

THOMAS MIDGLEY, JR.



THOMAS MIDGLEY, JR., scientist and inventor who died on November 2, contributed much to the comfort and convenience of millions of people throughout the world, yet except among scientists he was little known to those who benefited by his discoveries.

Of these, the first important one was his discovery of the efficacy of tetraethyl lead as an anti-knock agent. This was put on the market in 1923. During the seven years of work which led to it he tried more than 33,000 compounds which proved worthless. But his success at the end produced one of the most useful compounds of the modern world, Ethyl gasoline. Without tetraethyl lead we could not have the velvet power of the modern motor car or the 100 octane gasoline on which our warplanes fly.

Determining the anti-knock value of tetraethyl lead, however, was not the end of this particular scientific road. Dr. Midgley found also that chlorine and bromine compounds were essential, the one in manufacture, the other as an additive to carry the lead out of the engine. When a shortage of bromine developed, he suggested the ocean as a source for it. After Prof. Charles A. Kraus of Clark University, consultant to Standard Oil Co. (N. J.), worked out an improved method of producing tetraethyl lead, the oil company and the General Motors Corporation—for which Midgley discovered it — together formed the Ethyl Gasoline Corporation to market the product. Thus began one of the great chemical specialties of the world.

Next to tetraethyl lead, Midgley's most important discovery is Freon, the gas cooling agent now safely used in thousands of mechanical refrigerators. As he used to tell the story, Charles F. Kettering, head of General Motors Research Corporation, telephoned from Detroit and said "Midge, Frigidaire needs a non-toxic, non-inflammable refrigerant. See what you can do."

It was just the sort of assignment Midgley liked. He did not consider himself an inventor of the visionary kind, but preferred to use his efforts in trying to fill a specific need for a new thing, as he did in his pioneer studies of synthetic rubber as early as 1928 and in the labors that created his more than 100 other patents. So, using the chemists' periodic table of elements he took two of the most toxic gases known and combined them with inflammable gas to produce a non-toxic, non-inflammable gas. He developed his formula in less than a week.

Dr. Midgley's use of the periodic table in his work on Freon recalls his first contact with the table when he was a young student in Betts Academy at Stamford, Connecticut. The chemistry instructor suggested that the orderly arrangement of the atoms was evidence of the existence of God. Young Midgley protested vigorously that this statement flouted all logic, and began an argument which lasted for weeks. Though the discussion got nowhere, it did implant the periodic table firmly in Midgley's mind and therefore may have contributed toward his two great discoveries.

Thomas Midgley was born in the village of Beaver Falls, Pennsylvania, in 1889. He was graduated from Cornell in 1911 as a mechanical engineer. In the same year he took his first job, with the National Cash Register Company. From 1914 to 1916 he and his father, also an inventor, had their own tire and rubber company in Lancaster, Ohio. In the latter year began his long association with C. F. Kettering in Dayton. He worked with the General Motors Research Corporation from 1916 to 1918, and headed its fuel division from 1918 to 1923, when he became general manager of the General Motors Chemical Company. At the time of his death he had been vice president of the Ethyl Gasoline Corporation since 1924, of Kinetic Chemicals, Inc. since 1930, director of the Ethyl-Dow Chemical Company since 1933, and chairman of the board of the American Chemical Society since 1934. He was also president of the American Chemical Society.

He received many honors. He was the first man to hold the four most important medals in the field of chemistry — the Longstreth, 1925; Perkin, 1937; Priestly, 1941; and Willard Gibbs, 1942. He had received the Nichols medal in 1923 for his application of tetraethyl lead.

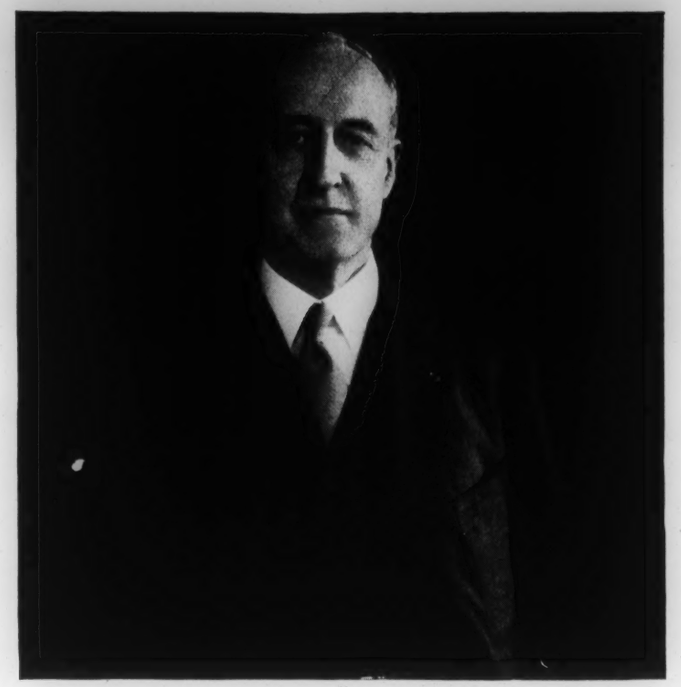
Always, however, he understated his own achievements and gave the biggest share of the credit to his associates. The chief of these was C. F. Kettering. "Without his guiding genius, faith, patience, and financial support," Midgley said, "it is likely that neither Ethyl gasoline nor Freon refrigerants would be in existence today." In the same way he emphasized the help of T. A. Boyd, Carroll A. Hochwalt, Robert A. Kehoe, Earle W. Webb, and C. A. Kraus on the various parts of the work on tetraethyl lead, of Albert L. Henne on the refrigerants, and of Herbert Dow on bromine.

Midgley's whole career was marked by patient struggle with difficulties. Until 1940 these difficulties were scientific problems which he attacked with vigor and persistence. In that year infantile paralysis deprived him of the use of his legs, and during the last four years of his life he was an invalid confined to bed and wheelchair. He steadfastly refused to give in to his affliction. He invented a harness to help him get in and out of bed, and kept on working.

On October 5, from his home at Worthington, Ohio, he delivered his last public address to the Standard Oil Development Company's forum in New York by radiotelephone. His speech, which dealt in a philosophic way with science as the vital instrument of the increased control which men have achieved over their environment throughout the ages, made a profound impression on the more than four hundred of Dr. Midgley's fellow scientists who heard it.

A month later Thomas Midgley was dead, strangled in his sleep by the harness he had invented.

CLARENCE J. HICKS



CLARENCE J. HICKS, whose contribution to industrial relations is the subject of the editorial in this issue, died on December 21 at the age of 81. Though his practical work lay mainly with Standard Oil Company (N. J.), his influence has been felt in all of U. S. industry. To him more than to any other one man has been due the development of liberal policies of many large organizations toward their employees.

The work which led to Mr. Hicks's distinction as the father of industrial relations began in 1915. Troubles in the Colorado Fuel and Iron Company had culminated in strike and riot which had not only thrown the company into tragic chaos but had precipitated a national scandal. Shocked by this condition, John D. Rockefeller, Jr. requested Mr. Hicks to lay down a broad program which would prevent any such thing from happening again.

Mr. Hicks accepted with enthusiasm. He had worked with his hands, had early absorbed the worker's point of view. And he kept this point of view through a long life devoted to the encouragement of mutual trust between those who labor with their hands and those who provide work for those hands. From that time to the present, largely as a result of the principles then laid down, both Colorado Fuel and Standard Oil (N. J.) have enjoyed an enviable record in their employee relations. Since then, Standard has had only one strike, and virtually no other labor troubles.

On the basis of this success in smoothing out the Colorado situation Mr. Hicks moved in 1917 to Standard Oil Company (N. J.), where he remained until he retired. The 17-point program which was drawn up for this company under Mr. Hicks's guidance in 1918 has served as the foundation upon which the company's more extensive present structure has been erected. It has been also a strong liberalizing influence in many other industries.

Mr. Hicks was ideally fitted for his work, by temperament as well as by preparation. He received his A.B. degree in 1884 and his LL.B. in 1888, both from the University of Wisconsin. He worked hard for his education — as a farmhand, as a molder in his brother's foundry, as a common laborer on a cement job, as a barrel handler in a wholesale grocery, as a tutor, as a traveling salesman.

With this experience behind him he chose to work for the Y.M.C.A. rather than to practice law as he originally intended. He started in college "Y" work in 1888. As the head of the railroad division in New York he investigated the conditions among Russian railroad employees for the Russian government. In 1901 he was made associate general secretary of the international committee of the "Y." During his ten years in this post he made 13 trips to Europe for the "Y" and supervised its club work in the Canal Zone.

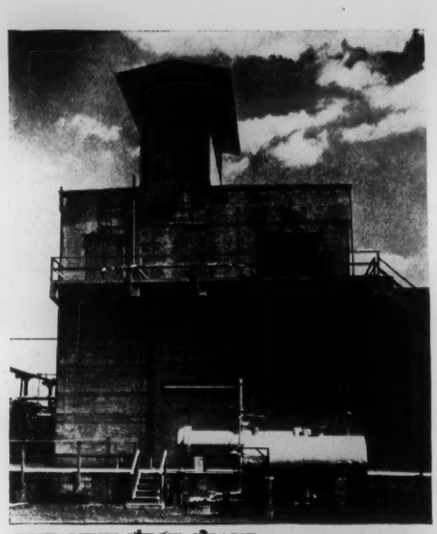
In 1911 Cyrus H. McCormick offered Mr. Hicks a place in the International Harvester Company to do welfare work. He remained with this company until 1915, when he began the work with Colorado Fuel and Iron which led to his long association with the Jersey company. Upon his retirement from the latter company in 1933, Mr. Rockefeller invited him to head the trustees of Industrial Relations Counselors, Inc., a non-profit organization devoted to the improvement of understanding between employers and employees in American industry. In 1937 he was made chairman of the executive committee of that organization, an office which he held until his death. During these years he was widely consulted as an established authority in his field. His counsel proved invaluable, not only to the Standard Oil Company (N.J.) but to many other companies in making adjustments to abruptly changing conditions.

The detailed story of Mr. Hicks's life work fills a whole book — his own book, *My Life in Industrial Relations*, published in 1941. He tells the story with modesty and candor. It reveals the energy and enthusiasm which he brought to his work, first with the Colorado and later with the Jersey company. It shows also the knowledge and the friendly wisdom which were so familiar, not only to the executives and employees of great corporations, but to hundreds of students at Princeton, Harvard, Yale, Michigan and other universities at which he lectured. In recognition of his achievements, Princeton and Michigan conferred honorary degrees upon him.

Mr. Hicks learned early in his career that most of his work would not be with the rank and file who were his chief concern, but with the men in paneled board rooms who formulated the policies. He entered these rooms frankly as the employees' advocate, but always with the true advocate's sense of the collateral rights of the public and the stockholders. One after another, plans which he worked out with the management were accepted by the employees.

His greatest single contribution was his creation of what he called industrial representation. He was impatient with arbitrary decisions made by top executives and handed to employees without adequate explanation of the thinking back of the orders. He believed there was essentially no difference between the human motives of the man who worked with pick and shovel and those of a corporation president. When strikes broke out he thought the blame too often belonged to the employer who had failed to understand employee grievances. Since obviously the executives could not personally consult thousands of workers, Mr. Hicks proposed the election of employee representatives to act as spokesmen in policy discussions. Through his efforts collective bargaining was conceived and put into effect before the phrase became a part of the language.

This and other important practices which were begun on his advice are today well nigh universal.



THE NEW TEST STAND: an exterior view

FOR FASTER AND FARTHER FLIGHT

Bayway's unique test stand opens way to super-fuels for airplane engines far more powerful than any now used

THROUGH THE WINDOW of the control room, the technicians at the instrument panel are able to watch the engine for such signs of knocking as smoke rings or tongues of yellow flame

THE new $500,000 aviation engine test stand, now in operation at the Bayway refinery of Standard Oil Company (N. J.), opens the door to a new era in the development of high octane gasolines for military aviation during the war and commercial aviation after the war.

Already the original 100 octane aviation gasoline has been left behind by the super-fuels now supplied to Allied air forces throughout the world. But in spite of the immense progress which has been made, in spite of the fact that the modern aviation engine is far more efficient than, for example, the conventional steam engine, about two-thirds of the energy in gasoline still goes to waste.

Power output is the result of a partnership between the fuel and the engine. Higher octane fuels are specially designed fuels which reveal their unique qualities only in specially designed engines.

By developing high knock resistance in gasoline, the fuel technician makes it possible for the engine designer to produce higher compression engines.

If the fuel technician raises the knock resistance of gasoline from, for example, a rating of 87 to 100 on the octane or anti-knock scale, he makes it possible for the engine designer to utilize more of the potential energy in the fuel and to get roughly 10 to 12 per cent more mileage out of the same volume of fuel.

It thus becomes possible to reduce the weight of fuel carried. This is a direction in which large economies have still to be made, for at present the weight of fuel which the heaviest bombers must carry may be three or four times the weight of the engines.

But these economies depend on the fuel technician's success in developing higher knock resistance. The new test stand at Bayway — the first full-scale aviation engine test stand in the oil industry — has been built to aid in developing new types of gasoline more resistant to knock and hence able to stand higher compressions. Its focal point, the multi-cylinder aviation engine in its big engine room, is merely the instrument for determining the combustion qualities of low- and high-test gasolines, standard reference gasolines and some of the pure hydrocarbons of gasoline.

While the blue and orange exhaust flames stab the darkness of the engine room, the power developed by the fuel's combustion is indicated in the adjacent control room by a beam of light on the face of a dial like a television screen.

If combustion is as it should be, the light beam traces a smoothly flowing pattern across the dial's face. If the gasoline knocks, the beam is thrown into violent oscillation. Knock tells its story on the face of the dial in much the same way as an earthquake tells its story on the tape of a seismograph.

Anchored to a 240-ton block of concrete, the engine has been stripped of its propeller and coupled instead to a dynamometer which absorbs and measures its power output. The engine used at present is air-cooled and radial, of a model so new that only a few of its kind have so far been produced. Being stationary, it does not create its own air-cooling, but has to be cooled by a blower which draws in 50,000 cubic feet of air per minute, tempers it and whips it across the engine at a velocity of 400 miles per hour. To maintain a constant test condition throughout the year, the temperature of the air stream, as delivered to the engine, is kept at 100 degrees F., even though the outdoor temperature may drop as low as zero.

The new test stand embodies the best and latest in the fields of construction, science and design. Existing aviation engine test stands throughout the United States and Canada were studied. Such stands have long been used for research into engine problems by the engine manufacturers and certain government agencies, but never before has any oil refiner mounted a multi-cylinder aviation engine on his own stand for research into fuel problems.

The older test stands were not always adequately soundproofed against the roar of the engine, with the result that men operating them were sometimes reduced to the writing of notes in order to communicate with each other. It is, of course, impossible to work in the immediate vicinity of the engine during a test. Men who work in inadequately soundproofed control rooms begin to yawn and are soon made drowsy by the terrific roar. To make the exhaust flames visible, the engine has to be run without the collector ring which in a plane serves to some extent as a muffler. Moreover, in a plane an engine has all the sky in which to dissipate its noise. In the engine room, its roar can shatter the eardrums. Both intake and exhaust flues towering above the test stand building, are lined with porous stone to absorb most of this noise which would otherwise escape into the outer air and prove disturbing to the neighborhood.

At Bayway, a 20-inch concrete wall isolates the control room from the heavily soundproofed engine room; and for protection against engine vibration, the control room rests on a separate concrete foundation which has been "floated" on cork. The panel of controls, indicators and recording instruments is arranged compactly around a window formed by four panes of heavy shatterproof glass through which the men at the controls are able to watch the engine at work. (See back cover.)

Here, within ten feet of the tremendous roar and vibration of the engine, the men behind the control room window do their work in a quiet which enables them to talk in ordinary conversational tones. Their observations of the engine frequently supplement the knock readings on the dial in the control room, for the throwing of smoke rings by some types of engines and tongues of yellow flame by others is a sure sign of knocking. To give maximum light in detecting smoke rings, the walls of the engine room have been painted white on a water-glass base, and to detect flame color the engine room is plunged into darkness.

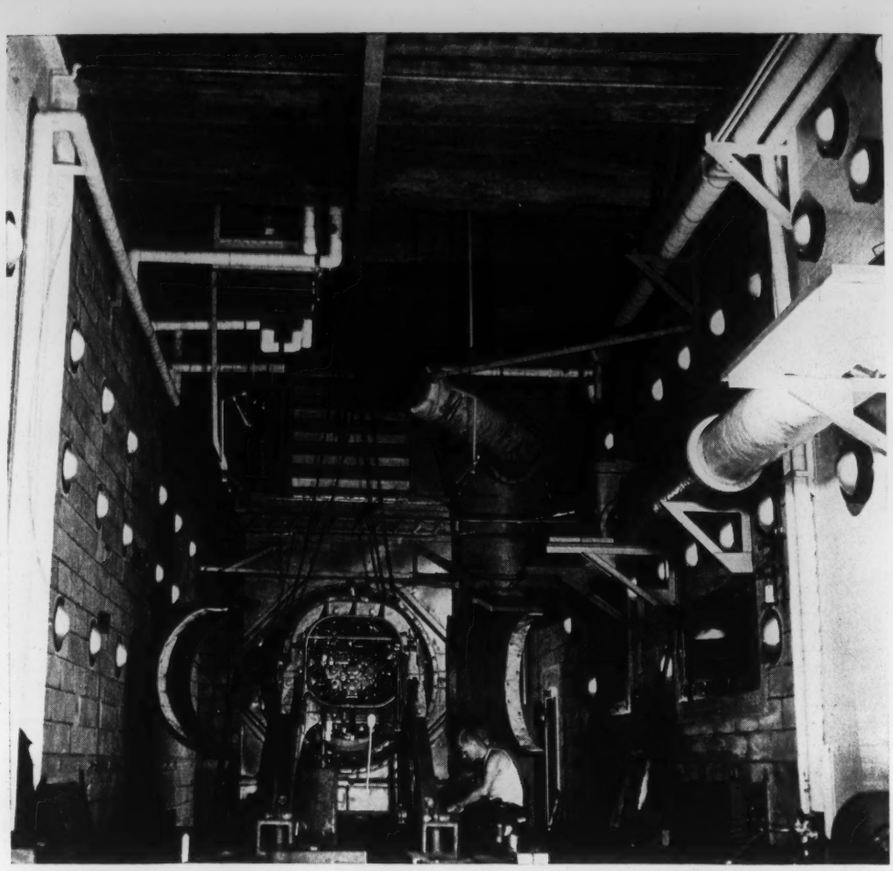
With its special accessory facilities, the new test stand is believed to be the finest of its kind in existence for quick and accurate studies in the relatively new field of super-power. These studies are expected to lead to three definite accomplishments:

1. An increase in the permissible power output of aviation engines through increasing the knock resistance of the fuel.
2. Accelerated improvement and increased production of the 100 octane gasoline now used by Allied air forces.
3. Development of gasoline hydrocarbons now little used as further sources of aviation fuel, thus making possible an early increase in production volume.

THE problem of knock and the arbitrary limit which it imposes on power output thus stands at the head of the new test stand's program. In 1918, at the close of the last war, even with the best straight-run gasolines, mean effective cylinder pressures in aviation engines had to be limited to 100 pounds per square inch. Since then much study has gone not only into the constituent hydrocarbons of gasoline, but also into commercially feasible methods of producing them.

Production costs of one of these hydrocarbons which has been found to be relatively free of knock have been reduced from something like $16 a gallon to between ten and 20 cents. It is an iso-octane whose molecular structure gives it the name of 2-2-4 trimethyl pentane. Blended with an equal volume of good virgin or catalytic gasoline and with a dose of tetraethyl lead added to the blend, iso-octane has given us the famous 100 octane aviation fuel which now makes it possible to get mean effective cylinder pressures of 215 pounds per square inch from the modern aviation engine. For comparison, cylinder pressures of 98.5 pounds are obtained from automobile engines.

By eliminating the other components and using iso-octane and tetraethyl lead alone, it is already possible to get 250 pound pressures from aviation engines. But without the base gasoline, it would be impossible to maintain the gigantic production of 500,000 barrels per day, which is essential to Allied air operations throughout the world. Catalytic and virgin



THE TERRIFIC ROAR makes it impossible to remain in the engine room during a test, but heavy soundproofing enables the technicians in the control room to converse in ordinary tones

gasolines will accordingly continue to be used until the war ends and today's terrific production of 100 octane is no longer necessary. Cylinder pressures of 250 pounds per square inch must therefore not be expected until after the war has ended.

Great as the advance since 1918 has been, the much-rumored rarity, triptane, has brought us within sight of engine powers far ahead of anything known today. While iso-octane's high resistance to knock is indicated by its rating of 100 on the octane or anti-knock scale, triptane has been found to be even higher in anti-knock quality, as indicated by its reported rating of 120 on the octane scale. Triptane does not occur naturally in gasoline, and commercial processes for making it synthetically have not yet reached the point of successful quantity production. When they do, it will be possible to blend an all-synthetic fuel, made of triptane, iso-octane and tetraethyl lead, which will remain free of knock under the tremendous mean effective cylinder pressure of 400 pounds per square inch.

"Triptane" is a coined name, as unrevealing as coined names are apt to be. It is another hydrocarbon, an iso-heptane whose molecular structure is described as 2-2-3 trimethyl butane. Its chemical formula is C_7H_{16}, the same as that of normal heptane, a gasoline hydrocarbon which knocks under almost any pressure and hence is worthless as an airplane engine fuel. The only difference between them is the straight-chain arrangement of the atoms in the molecule of normal heptane, and the branched or "isomerized" structure of the triptane molecule. In the laboratory, indeed, normal heptane and triptane are as like as twins, and it takes the most sensitive of instruments to distinguish between them. But they are poles apart in test engines. Properly equipped with knock and other indicators, the full-scale test engine is thus a highly sensitive analytical instrument able to indicate fuel qualities with accuracy under flight conditions.

Standard Oil Company (N. J.) erected its first single-cylinder test engine for aviation gasoline in 1920 at a cost of $500.

Numerous subsequent stages in the development of the original single-cylinder test engine resulted in the installation before the war of full-scale single-cylinders of aviation engines mounted on experimental universal crankcases and costing in the neighborhood of $20,000. Prior to the construction of the test stand these single cylinder engines were the only aviation test engines owned by the oil industry.

This was still testing on a laboratory scale. But in the years before the war when the demand for aviation gasoline was small, there was no very urgent need of anything better.

However, the demand shot up to undreamed of heights as the war developed and something better became essential. The fuel technicians began supplementing their single-cylinder engines by using the multi-cylinder facilities of the engine manufacturers and of such government agencies as the National Advisory Committee for Aeronautics, the Army Air Forces, the Navy Bureau of Aeronautics and the National Bureau of Standards. The study of fuel problems on these full-scale engines was necessarily secondary to the study of engine development and manufacturing problems.

Indeed, the time came when the study of engine problems strained these full-scale facilities beyond their normal capacity, and it became essential for Standard Oil Development Company, the central research affiliate of Standard Oil Company (N. J.) and its group, to acquire its own full-scale test stand, even though such a project involved an initial outlay of $500,000 and prospective operating expenses of $100,000 a year.

Until construction began in 1943, available materials had been going into the expansion of gasoline production capacities and the building of urgently needed toluene and synthetic rubber plants.

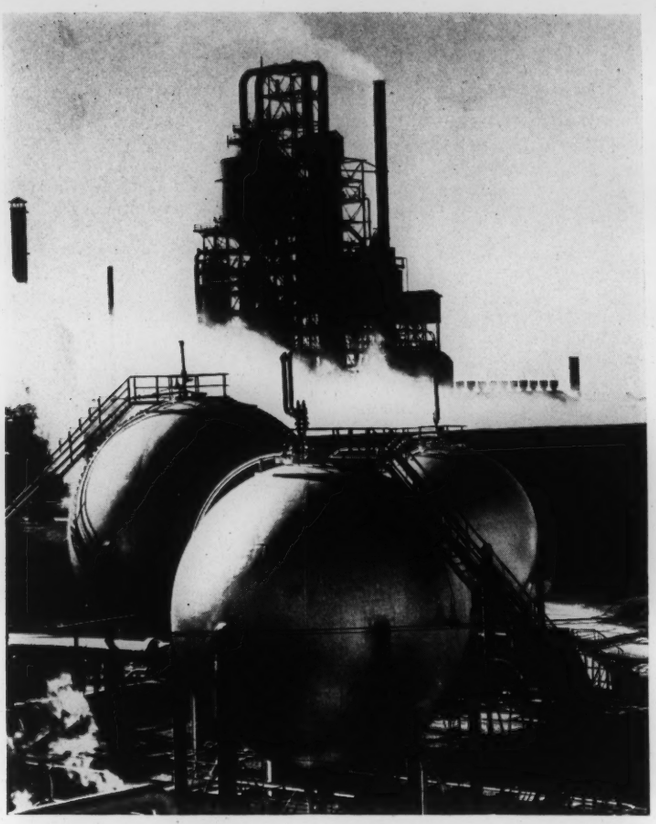
The new test stand was to depart from the old single-cylinder stands by providing test facilities on full-scale multi-cylinder engines under simulated flight conditions as applied to the engine and with instruments providing accuracy of measurement to meet the most exacting research demands.

Every detail was designed with a view to eliminating the last one per cent of error. Such items as mechanical linkages for remote indications were ruled out and frictionless light beams were adopted instead. Most of the controls and other instruments operated by hand in the older stands were made automatic in the new stand and as nearly foolproof as it was possible to make them. As a result, two men in the control room are able to run a test in the new stand, as compared to the six or eight required in some of the older full-scale stands.

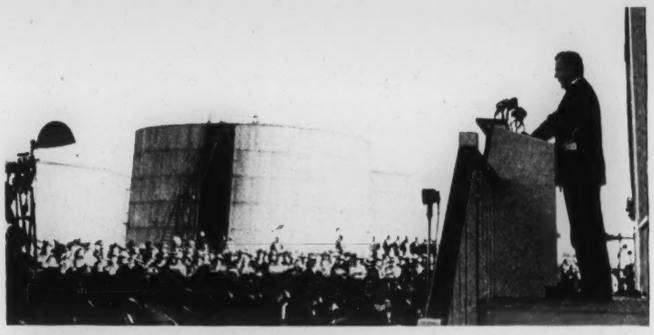
By June 1943, the government agencies involved were ready with their cooperation, and the Development company's blueprints were complete. Construction, entirely at the company's expense, was finished in 1944.

As a result, Standard Oil Development Company is now equipped to employ the most effective of existing instruments for learning how fuels behave. Thus the way is opened to an early increase in the production of aviation fuel and also to development of the more powerful super-fuels of the future.

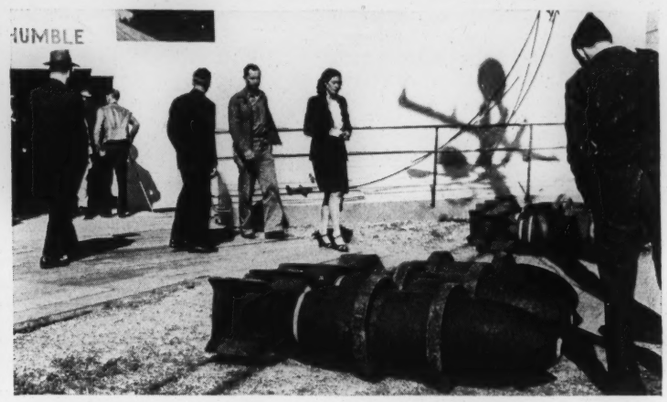
HUMBLE'S BILLIONTH GALLON



BAYTOWN REFINERY of Humble Oil & Refining Company, Jersey affiliate in Texas, having produced more than a billion gallons of 100 octane gasoline, marked the event by "Billion-Gallon Day"



"HUMBLE'S MEN AND WOMEN have worked day and night for victory," H. C. Wiess, president of company, told audience at billionth gallon ceremony held within the refinery grounds on December 14



TNT MADE OF TOLUENE derived from petroleum at Baytown Ordnance Works has packed at least one of every two United Nations' bombs since Pearl Harbor. Military exhibit featured sample bombs

ROW AFTER ROW of the tank cars which start 100 octane gasoline on its long journey to the war fronts line up at Humble's Baytown refinery. Tall Fluid catalytic cracking unit in background plays an important part in the manufacture of 100 octane aviation gasoline

Oil Notes

KEROSENE IN DRUMS . . . For the third winter season, the oil industry is resorting to boxcar shipments of kerosene to meet New England's rationed requirements. Shipment of kerosene in steel drums in freight cars is necessary to take care of the thousands of people in New England who depend completely on kerosene for heating and cooking and who cannot get substitute fuels. Tank cars normally used in this service have been shifted to military use.

Deputy Petroleum Administrator Ralph K. Davies pointed out that only through the cooperation of the Army, the Defense Supplies Corporation, the railroads and the oil companies is this type of shipment possible.

"Arrangements have been made with the Army's Quartermaster Corps to make available 500,000 used 16-gauge steel drums for this movement," Mr. Davies said. "The movement of kerosene by drums in freight cars is very expensive — the cost may run as high as 15 cents a gallon, or $6 a barrel. The added expense will be borne by the government through the Defense Supplies Corporation, and there will be no increased cost to the consumer . . . The comfort and health of thousands of our citizens in the New England area cannot be counterbalanced against the increased cost."

ASIA'S 'BIG INCH' . . . *A two-year blanket of secrecy was lifted recently when American Army headquarters in India announced that the main portion of a fuel pipeline which ultimately will reach from Calcutta across Burma into central Yunnan Province in China had been completed.*

Believed to be the greatest pipeline construction feat in history, the line has already reached northern Burma and is now delivering thousands of tons of oil and gasoline monthly to fuel planes and vehicles in the combat area. Of great strategic importance from the supply standpoint, the line when completed will be more than 1,800 miles long — considerably longer than the "Big Inch" from Longview, Texas, to New York.

BUTYL FOR LIGHT TRUCK TIRES . . . Butyl rubber has been shown in tests run by government and private agencies to be superior to natural rubber for inner tube manufacture. Carried out over the last three years the tests so far have covered more than 165 million miles of road under extreme conditions of heat and cold. With expansion in production of Butyl rubber, the War Production Board is allowing the rubber heretofore restricted to large bus and truck sizes to be used in manufacturing tires down to small truck tire sizes.

Butyl rubber was developed at the Esso Laboratories of the Standard Oil Development Company, research affiliate of Standard Oil Company (N. J.).

OIL IN BRITAIN . . . An oil field somewhere in Britain, developed since the start of the war, now is producing high grade oil at the rate of 26 million gallons a year, according to an official announcement from London. The field is located in an unnamed farming section and covers a stretch of country two miles long and half a mile wide. Cattle graze among the wells. As Britain's Petroleum Secretary puts it: "The slogan here is milk and oil from the same field."

SUBSTITUTES CAUSE CORROSION . . . The Department of Commerce reports that substitute fuels used in vehicles in Switzerland cause metal parts to corrode quickly. Recently it was reported that out of 85,000 motor vehicles withdrawn because of a shortage of fuel and parts, between 25,000 and 35,000 are in such disrepair that they cannot be restored to service after the war. About 100,000 metric tons of wood and 20,000 tons of charcoal, or the equivalent of 29,059,000 gallons of gasoline, are consumed annually in Switzerland as motor fuel.

BUNA-S FOR RAINCOATS . . . The Quartermaster Corps, after comparative field tests, has decided that raincoats prepared with Buna-S are as effective as those made with resin-coated materials, in so far as protection against rain, ease of repair, and resistance to packing and folding are concerned.

According to Quartermaster Corps specifications, a manufacturer may supply raincoats in either material but until recently the supply of synthetic rubber has been limited. As the supply increases it is believed more rain garments will be made with synthetic rubber due to its slightly lower cost.

ESSO IN FRANCE . . . An unexpected reminder of home in the familiar Esso sign inspired one Baltimore refinery employee now in the armed forces to write this note back to his friends at the plant:

> *"Just a few lines to let you know that I landed in France safely, and was very surprised to see the many Esso signs. If it weren't for the complete destruction of the towns, one would think he was home. However, the Esso signs did look good, and to me they sort of dressed France up."*

OIL FOR OVERSEAS . . . According to the report of Lieut. General Somervell, the Army Service Forces during the fiscal year 1944 hauled over a billion dollars' worth of gasoline for overseas use of ground vehicles, 50 million gallons of engine oil, three million gallons of gear lubricants, and 45 million pounds of greases.

The report also discloses that each month tankers carried overseas on their decks supplies equal to the contents of 25 cargo vessels. Installation during 1944 of special decks on some 500 tankers permitted the hauling, in assembled condition, of over 12,000 of a total of 19,000 planes moved by ships.

THREE STARS NOW . . . *For the fourth time in less than two years the Esso Laboratories of Standard Oil Development Company have won the Army-Navy Production Award for outstanding achievement in producing materials essential to the war effort. The Development company, central research organization for Standard Oil Company (N. J.) affiliates, was the first such group in the oil industry to win the award for technical achievement, in March 1943. It has since won the right to add three white stars to its original "E" flag.*

Among the war weapons which Esso Laboratories helped to develop are a new type of smoke screen generator, an improved portable flamethrower and an oil incendiary bomb.

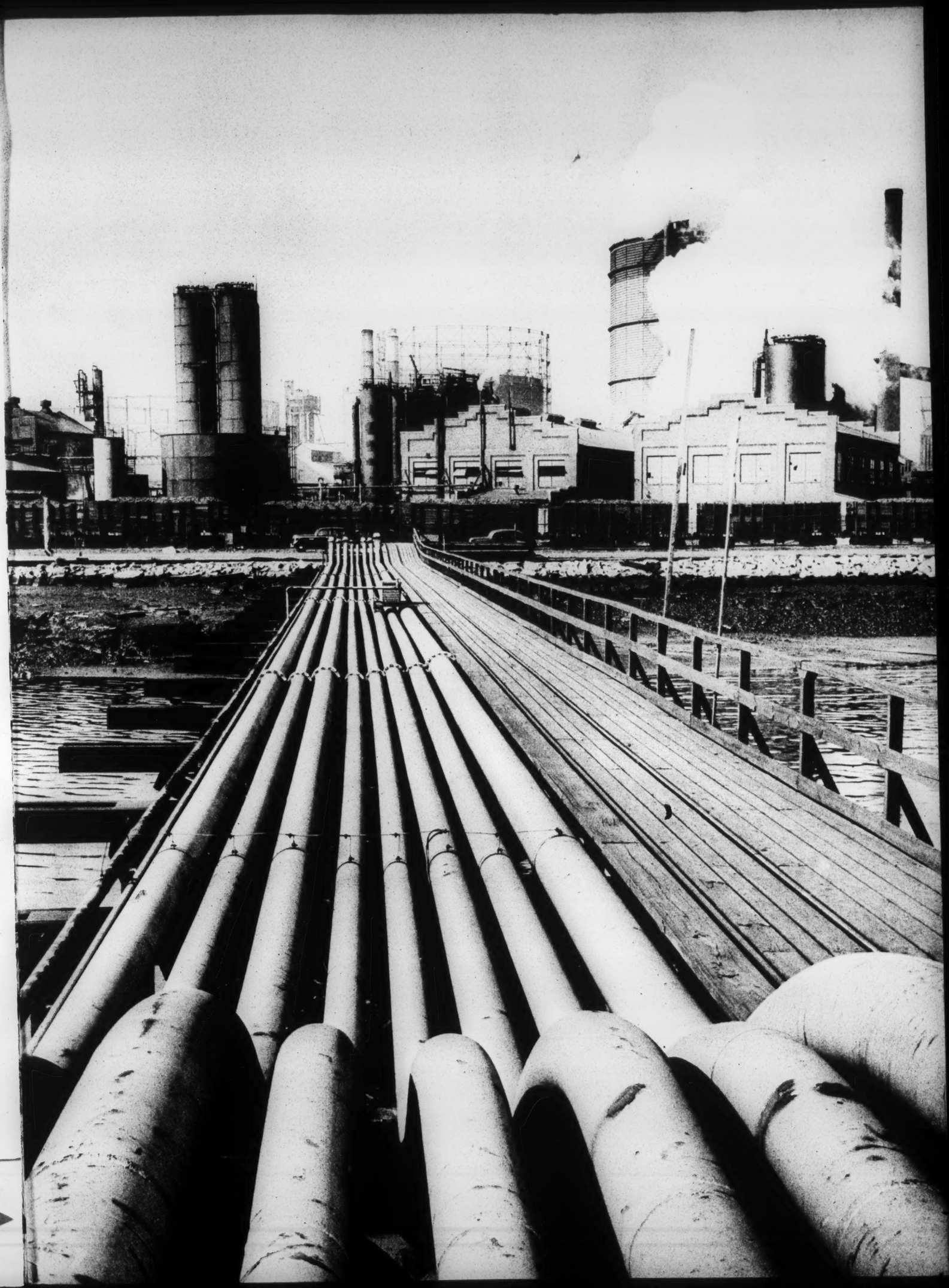
SICK INN . . . How a specially organized unit of five flight surgeons and 13 enlisted technicians made military medical history in Burma's jungles came to light recently in the report of the command surgeon, Major Robert C. Page, to the War Department.

Major Page, on military leave from Standard Oil Company of New Jersey's medical department at 30 Rockefeller Plaza, is now attached to the Office of the Air Surgeon in Washington, D. C.

In a tea planter's cottage at the air commando base in Assam, not far from the Japanese lines and 200 miles from the nearest Army general hospital, Major Page and his group set up "Sick Inn," a 36-bed unit with the most modern hospital equipment, flown in by air freight.

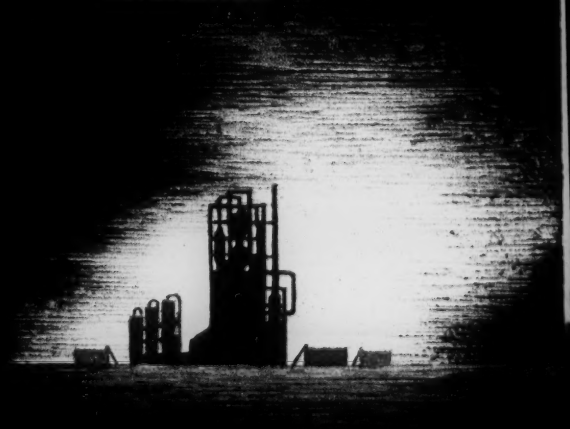
From this unique hospital, the specially picked surgeons, pilots all, accompanied American airborne engineers and General Wingate's glider troops, whose twofold mission it was to establish an air base in Burma and fight the enemy there. First aid stations were set up as soon as the gliders landed in Burma and casualties were emergency-treated and flown back to "Sick Inn" for additional care. Thirty per cent of the air commandos were hospitalized at "Sick Inn" at some time during the three-month mission but at the end of that time 92 per cent were fit for further duty.

PIPELINES connecting tanker terminal and a Colonial Beacon Oil Company refinery at an East Coast port carry various petroleum fuels. Hose runs from tanker to pipelines; pumps force fuels through



TOWARD THE FUELS OF THE FUTURE

In the new $500,000 test stand at Bayway, N. J., the first full-scale aviation test engine to be used by the oil industry serves only as an instrument for testing gasoline. The test stand makes it possible to obtain accurate information on gasoline performance under simulated flight by setting up controlled conditions measured by instruments, the most important of which are shown enlarged in the drawing above



OCCUPATIONS - PETROLEUM

U. S. Department of Labor
Bureau of Labor Statistics
Employment and Occupational Outlook Branch
Productivity and Technological Development Division

EMPLOYMENT OF WOMEN IN THE PETROLEUM INDUSTRY

Prepared
in cooperation with
Petroleum Administration for War

September 1943

(LS 44-1029)

EMPLOYMENT OF WOMEN IN THE PETROLEUM INDUSTRY

This report supplements and to some extent supersedes the mimeographed report on "Employment of Women in Petroleum Refineries" which appeared in July 1943. The 181 establishments surveyed include other divisions of the Petroleum Industry as well as Refining: Marketing; General Office; Production, Exploration, and Well Service; Development Laboratory; Natural Gas and Gasoline; and Pipeline Transportation. Coverage in terms of employment is considerably greater than it was in the earlier report--65,509 employees compared to 27,646, and 6,339 women compared to 2,627. The tables presented in this report are also more detailed. The list of jobs, for example, is more extensive, and the number of women in each occupation is shown for each Petroleum Administration for War District.

The information on which this report is based was derived from Replacement Schedules analyzed by the U. S. Bureau of Labor Statistics at the request of, and in cooperation with, the Petroleum Administration for War. The tabulations indicate that women are being employed in a great variety of jobs hitherto occupied only by men--in operation and maintenance as well as in the office and laboratory, and in production and marketing as well as in refining. Women comprise 9.7 percent of total employment in the Petroleum Industry and 8.1 percent of the total in Refining. The corresponding percentages for women in non-office positions, 3.9 and 4.1, are more significant indicators of the progress made in the utilization of female labor. The record of District V is far superior to the record of all the others. In this District, women in non-office positions account for 11.8 percent of employment in all Industry divisions and 16.2 percent of employment in Refining. In each of the other Districts, women in non-office jobs account for less than 4 percent of the corresponding totals.

Additional copies of this report and of the one which it supplements, "Employment of Women in Petroleum Refineries," may be obtained upon request from the Labor Counselor, Petroleum Administration for War, Washington 25, D. C., or from the Productivity and Technological Development Division, U. S. Bureau of Labor Statistics, Washington 25, D. C.

Table I

DISTRIBUTION OF WOMEN EMPLOYED IN REPORTING ESTABLISHMENTS OF THE PETROLEUM INDUSTRY, BY DISTRICT AND TYPE OF WORK 1/

	All Districts	Women Employed In Petroleum Administration for War District				
		I	II	III	IV	V
Refining and other divisions	6,339	1,582	939	1,660	137	2,021
Refining	3,750	754	652	1,143	137	1,064
Operation	982	228	35	114	17	588
Maintenance	155	16	41	52	3	43
Laboratory	695	126	101	192	22	254
Office	1,842	354	458	759	92	179
Other	76	30	17	26	3	0
All other industry divisions	2,589	828	287	517	-	957
Operation	13	8	-	2	-	3
Maintenance	34	6	-	3	-	25
Laboratory	227	91	29	58	-	49
Office	1,931	649	254	451	-	577
Other	384	74	4	3	-	303
		Percentage Distribution				
Refining	100.0	100.0	100.0	100.0	100.0	100.0
Operation	26.2	30.2	5.4	10.0	12.4	55.3
Maintenance	4.1	2.1	6.3	4.5	2.2	4.0
Laboratory	18.6	16.7	15.5	16.8	16.1	23.9
Office	49.1	47.0	70.2	66.4	67.1	16.8
Other	2.0	4.0	2.6	2.3	2.2	-
All other industry divisions	100.0	100.0	100.0	100.0	-	100.0
Operation	0.5	1.0	-	0.4	-	0.3
Maintenance	1.3	0.7	-	0.6	-	2.6
Laboratory	8.8	11.0	10.5	11.2	-	5.1
Office	74.6	78.4	88.5	87.2	-	60.3
Other	14.8	8.9	1.0	0.6	-	31.7

1/ This table is based on data for 181 establishments employing 65,509 persons (see Table 2); 12 of these establishments, employing 455 persons, do not report any women. The term "establishment," as used in this and subsequent tables, refers to an organizational unit or division of a company--a refinery, marketing division, general office, development laboratory, etc. For a list of industry divisions, see Table 2.

Table II

EMPLOYMENT OF WOMEN IN REPORTING ESTABLISHMENTS OF THE PETROLEUM INDUSTRY, BY DISTRICT AND INDUSTRY DIVISION

	All Districts	Petroleum Administration for War District				
		I	II	III	IV	V
Industry, Total 1/						
Number of establishments	181	36	49	65	16	14
Total employment	65,509	15,749	12,837	24,637	1,580	10,706
Number of women employed	6,339	1,582	939	1,660	137	2,021
Percent of total employment	9.7	10.0	7.3	6.7	8.7	18.9
Refining						
Number of establishments	117	25	38	33	16	5
Total employment	46,391	11,305	11,654	16,384	1,580	5,468
Number of women employed	3,750	754	652	1,143	137	1,064
Percent of total employment	8.1	6.7	5.6	7.0	8.7	19.5
Marketing (bulk plant and service stations)						
Number of establishments	5	2	1	-	-	2
Total employment	4,699	2,284	171	-	-	2,244
Number of women employed	882	343	4	-	-	535
Percent of total employment	18.8	15.0	2.3	-	-	23.8
General Office						
Number of establishments	13	2	5	3	-	3
Total employment	2,114	759	552	333	-	470
Number of women employed	882	298	231	105	-	248
Percent of total employment	41.7	39.3	33.6	31.5	-	52.8
Production, Exploration, Well Service						
Number of establishments	25	1	1	19	-	4
Total employment	7,634	5	233	4,872	-	2,524
Number of women employed	518	2	24	318	-	174
Percent of total employment	6.8	40.0	10.3	6.5	-	6.9
Development Laboratory						
Number of establishments	6	4	1	1	-	-
Total employment	1,413	1,211	150	52	-	-
Number of women employed	211	179	24	8	-	-
Percent of total employment	14.9	14.8	16.0	15.4	-	-

Table II (Continued)

	All Districts	Petroleum Administration for War District				
		I	II	III	IV	V
Natural Gas and Gasoline						
Number of establishments	4	-	-	4	-	-
Total employment	1,241	-	-	1,241	-	-
Number of women employed	58	-	-	58	-	-
Percent of total employment	4.7	-	-	4.7	-	-
Pipe-Line Transportation						
Number of establishments	11	2	3	6	-	-
Total employment	2,017	185	77	1,755	-	-
Number of women employed	38	6	4	28	-	-
Percent of total employment	1.9	3.2	5.2	1.6	-	-

1/ As indicated in Table I, 12 establishments having 455 employees do not report any women. If these establishments were omitted from consideration, the effect on the percentages would be negligible; a few would not be altered, and the others would not be raised by more than 0.1 of a percentage unit.

Table III

WOMEN EMPLOYED IN REPORTING ESTABLISHMENTS OF THE PETROLEUM INDUSTRY, BY OCCUPATION 1/ AND DISTRICT

Occupation	All establishments	Refineries						All Other Industry Divisions				
		All Districts	Petroleum Administration for War District					All Districts	Petroleum Administration for War District 2/			
			I	II	III	IV	V		I	II	III	V
All occupations	6,339	3,750	754	652	1,143	137	1,064	2,589	828	287	517	957
Operation, total	995	982	228	35	114	17	588	13	8	-	2	3
Barrel inspector	2	2	-	-	-	-	2	-	-	-	-	-
Barrel sealer	4	4	-	-	-	-	4	-	-	-	-	-
Brander, sprayer, stenciller	33	33	20	-	6	-	7	-	-	-	-	-
Bung and vent remover	4	4	-	-	-	-	4	-	-	-	-	-
Bung and vent tightener	4	4	-	-	-	-	4	-	-	-	-	-
Can maker	11	11	7	-	-	-	4	-	-	-	-	-
Candle dipper	2	2	2	-	-	-	-	-	-	-	-	-
Candle packer	39	39	39	-	-	-	-	-	-	-	-	-
Compounder	1	1	-	-	-	-	1	-	-	-	-	-
Container filler and weigher	34	34	-	9	-	-	25	-	-	-	-	-
Container handler	29	29	-	-	-	-	29	-	-	-	-	-
Controlman	38	38	-	-	-	-	38	-	-	-	-	-
Cooper, machine	4	4	-	-	-	-	4	-	-	-	-	-
Counterman	1	-	-	-	-	-	-	1	1	-	-	-
Cylinder inspector	2	2	-	-	-	-	2	-	-	-	-	-
Dispatcher	4	-	-	-	-	-	-	4	4	-	-	-
Fireman, stills	12	12	-	-	-	-	12	-	-	-	-	-
Forelady	2	2	1	-	1	-	-	-	-	-	-	-
Forelady, assistant	1	1	1	-	-	-	-	-	-	-	-	-
Gager	103	103	5	-	-	-	98	-	-	-	-	-

Table III (Continued)

Occupation	All establishments	Refineries						All Other Industry Divisions				
		All Districts	Petroleum Administration for War District					All Districts	Petroleum Administration for War District 2/			
			I	II	III	IV	V		I	II	III	V
Helper:												
Barrel filler	5	5	-	-	5	-	-	-	-	-	-	-
Boiler fireman	1	1	-	-	1	-	-	-	-	-	-	-
Compounder	80	80	-	1	79	-	-	-	-	-	-	-
Gas plant	1	1	-	1	-	-	-	-	-	-	-	-
Process	15	15	-	-	-	15	-	-	-	-	-	-
Stabilizer	3	3	-	-	-	-	3	-	-	-	-	-
Stillman	3	3	-	3	-	-	-	-	-	-	-	-
Steam plant	1	1	-	1	-	-	-	-	-	-	-	-
Transfer	1	1	-	1	-	-	-	-	-	-	-	-
Treater	1	1	-	1	-	-	-	-	-	-	-	-
Utility	77	77	-	6	-	-	71	-	-	-	-	-
Inspector	50	50	50	-	-	-	-	-	-	-	-	-
Laborer	117	116	10	-	-	1	105	1	-	-	1	-
Laborer, specialty	23	23	23	-	-	-	-	-	-	-	-	-
Loader	6	6	-	-	-	-	6	-	-	-	-	-
Operator:												
Compressor	7	7	-	-	3	-	4	-	-	-	-	-
Nailing machine	8	8	8	-	-	-	-	-	-	-	-	-
Solvent plant	1	1	-	-	-	-	1	-	-	-	-	-
Still	35	35	-	-	-	-	35	-	-	-	-	-
Other 3/	46	46	-	-	-	-	46	-	-	-	-	-
Package preparation girl	3	3	3	-	-	-	-	-	-	-	-	-
Packaging assistant	47	47	47	-	-	-	-	-	-	-	-	-
Packer	20	20	-	-	-	-	20	-	-	-	-	-
Pumper	25	25	-	-	-	-	25	-	-	-	-	-
Rodman	4	4	-	-	-	-	4	-	-	-	-	-
Roustabout	3	-	-	-	-	-	-	3	-	-	-	3
Specialty maker	1	1	-	-	-	1	-	-	-	-	-	-
Stencilcutter	1	1	-	-	-	-	1	-	-	-	-	-
Storekeeper	1	-	-	-	-	-	-	1	1	-	-	-
Stock supervisor	1	1	-	-	1	-	-	-	-	-	-	-

Table III (Continued)

Occupation	All establishments	Refineries						All Other Industry Divisions				
		All Districts	Petroleum Administration for War District					All Districts	Petroleum Administration for War District 2/			
			I	II	III	IV	V		I	II	III	V
Stores clerk	14	13	2	8	-	-	3	1	-	-	1	-
Tailhouseman	4	4	-	-	-	-	4	-	-	-	-	-
Treater	21	21	-	-	-	-	21	-	-	-	-	-
Trenailer	2	2	-	-	-	-	2	-	-	-	-	-
Warehouseman	6	4	-	-	1	-	3	2	2	-	-	-
Warehouse assistant	4	4	-	4	-	-	-	-	-	-	-	-
Wax packer	17	17	-	-	17	-	-	-	-	-	-	-
Weigher	2	2	2	-	-	-	-	-	-	-	-	-
Wick knotter	7	7	7	-	-	-	-	-	-	-	-	-
Wick sewer	1	1	1	-	-	-	-	-	-	-	-	-
Office, total	3,773	1,842	354	458	759	92	179	1,931	649	254	451	577
Accountant	15	1	-	-	1	-	-	14	-	1	12	1
Attorney	2	1	-	1	-	-	-	1	-	-	-	1
Bookkeeper	41	28	7	1	10	9	1	13	4	2	5	2
Cashier	12	3	-	-	-	3	-	9	1	1	1	6
Checker	10	3	3	-	-	-	-	7	-	7	-	-
Clerk:												
Senior 4/	77	52	4	29	5	14	-	25	16	2	6	1
Accounting, not otherwise specified	332	144	28	38	78	-	-	188	119	8	19	42
Administrative	1	-	-	-	-	-	-	1	1	-	-	-
Advertising	1	-	-	-	-	-	-	1	1	-	-	-
Audit	4	-	-	-	-	-	-	4	3	-	1	-
Billing	42	20	17	1	2	-	-	22	8	1	-	13
Bookkeeping	35	7	-	-	7	-	-	28	7	3	-	18
Cable and telegraph	5	-	-	-	-	-	-	5	-	-	-	5
Compounding	3	3	-	1	2	-	-	-	-	-	-	-
Coordination	1	-	-	-	-	-	-	1	1	-	-	-
Cost	31	30	21	8	1	-	-	1	-	-	1	-
Credit	4	-	-	-	-	-	-	4	-	-	-	4
Depot	21	-	-	-	-	-	-	21	-	-	-	21
Dispatching	5	-	-	-	-	-	-	5	-	-	4	1

Table III (Continued)

Occupation	All establishments	Refineries						All Other Industry Divisions				
		All Districts	Petroleum Administration for War District					All Districts	Petroleum Administration for War District 2/			
			I	II	III	IV	V		I	II	III	V
Division	28	-	-	-	-	-	-	28	-	-	28	-
Distribution	1	1	1	-	-	-	-	-	-	-	-	-
District	33	-	-	-	-	-	-	33	-	-	33	-
Drafting	1	-	-	-	-	-	-	1	1	-	-	-
Engineering	8	7	-	4	3	-	-	1	-	-	1	-
Expediting	1	-	-	-	-	-	-	1	1	-	-	-
Export	1	-	-	-	-	-	-	1	1	-	-	-
Field	20	12	-	6	1	-	5	8	1	-	7	-
File	73	27	4	7	14	-	2	46	17	18	4	7
Garage	1	-	-	-	-	-	-	1	-	-	-	1
Geological	1	1	-	-	1	-	-	-	-	-	-	-
Information	2	2	-	2	-	-	-	-	-	-	-	-
Insurance	4	-	-	-	-	-	-	4	3	-	-	1
Invoice	5	4	-	2	2	-	-	1	1	-	-	-
Legal	3	-	-	-	-	-	-	3	-	-	2	1
Loading	2	1	-	1	-	-	-	1	1	-	-	-
Mail	42	1	1	-	-	-	-	41	-	9	1	31
Maintenance	3	3	-	-	3	-	-	-	-	-	-	-
Order	8	2	2	-	-	-	-	6	-	6	-	-
Payroll	48	27	14	13	-	-	-	21	14	-	7	-
Perpetual inventory	13	10	9	1	-	-	-	3	-	-	3	-
Personnel	50	22	8	1	13	-	-	28	-	-	1	27
Production Control	15	15	6	1	8	-	-	-	-	-	-	-
Proration	4	-	-	-	-	-	-	4	-	-	4	-
Purchasing	17	2	-	2	-	-	-	15	7	-	-	8
Rate	1	-	-	-	-	-	-	1	1	-	-	-
Records	3	2	-	2	-	-	-	1	-	-	1	-
Routing	1	1	-	1	-	-	-	-	-	-	-	-
Shipping	46	45	4	17	24	-	-	1	-	-	1	-
Stationary	6	4	-	4	-	-	-	2	2	-	-	-
Statistical	7	-	-	-	-	-	-	7	5	-	-	2
Stock	42	34	-	1	33	-	-	8	-	1	6	1

Table III (Continued)

Occupation	All establishments	Refineries						All Other Industry Divisions				
		All Districts	Petroleum Administration for War District					All Districts	Petroleum Administration for War District 2/			
			I	II	III	IV	V		I	II	III	V
Stock record	5	5	-	-	5	-	-	-	-	-	-	-
Supply	2	2	-	-	2	-	-	-	-	-	-	-
Tax	6	-	-	-	-	-	-	6	-	-	3	3
Time	7	7	1	5	1	-	-	-	-	-	-	-
Tracing and contact	1	1	-	-	1	-	-	-	-	-	-	-
Traffic	20	13	-	11	2	-	-	7	3	-	-	4
Yard	1	1	-	1	-	-	-	-	-	-	-	-
Yield	20	20	10	6	4	-	-	-	-	-	-	-
Not specified	488	374	64	85	66	31	128	114	29	27	34	24
Credit supervisor	2	1	1	-	-	-	-	1	-	1	-	-
Credit woman	2	-	-	-	-	-	-	2	-	1	-	1
Engineering assistant	1	-	-	-	-	-	-	1	1	-	-	-
Expediter	1	-	-	-	-	-	-	1	-	-	1	-
Librarian	5	3	-	1	2	-	-	2	2	-	-	-
Machine operator:												
Addressograph	9	2	-	-	2	-	-	7	3	1	-	3
Billing	9	1	1	-	-	-	-	8	-	8	-	-
Bookkeeping	51	4	-	1	-	3	-	47	11	17	7	12
Calculating	49	13	-	-	13	-	-	36	-	36	-	-
Comptometer	156	36	10	8	14	-	4	120	25	1	45	49
Ditto	6	6	-	-	6	-	-	-	-	-	-	-
Duplicating	3	-	-	-	-	-	-	3	-	1	-	2
Hectograph	1	-	-	-	-	-	-	1	1	-	-	-
Key punch	52	25	-	4	21	-	-	27	5	3	2	17
Mimeograph	1	-	-	-	-	-	-	1	1	-	-	-
Sortergraph	1	-	-	-	-	-	-	1	-	1	-	-
Tabulating	4	4	-	3	1	-	-	-	-	-	-	-
Teletype	9	6	-	1	3	-	2	3	-	-	1	2
Not specified	10	-	-	-	-	-	-	10	-	-	10	-
Messenger and office girl	58	53	5	5	40	-	3	5	4	-	1	-
Paymaster	1	1	-	-	1	-	-	-	-	-	-	-

Table III (Continued)

Occupation	All establishments	Refineries						All Other Industry Divisions				
		All Districts	Petroleum Administration for War District					All Districts	Petroleum Administration for War District 2/			
			I	II	III	IV	V		I	II	III	V
Personnel counselor	4	2	-	1	-	-	1	2	-	-	-	2
Receptionist	24	4	-	3	-	1	-	20	9	1	8	2
Secretary	144	60	13	11	33	3	-	84	12	14	34	24
Secretary treasurer	3	1	-	1	-	-	-	2	-	1	1	-
Section supervisor	10	1	-	-	1	-	-	9	4	-	1	4
Special assistant	1	-	-	-	-	-	-	1	1	-	-	-
Statistician	1	-	-	-	-	-	-	1	1	-	-	-
Stenographer, head	6	4	-	2	-	-	2	2	-	-	-	2
Stenographer	987	403	48	119	189	24	23	584	238	59	124	163
Switchboard operator, chief	7	5	-	2	3	-	-	2	-	-	-	2
Switchboard operator	152	74	24	10	31	1	8	78	29	2	12	35
Timekeeper	5	5	3	-	2	-	-	-	-	-	-	-
Touring service representative	1	-	-	-	-	-	-	1	-	-	-	1
Typist and typist clerk	313	190	45	34	108	3	-	123	54	21	19	29
Wrapper	2	-	-	-	-	-	-	2	-	-	-	2
Laboratory, total	922	695	126	101	192	22	254	227	91	29	58	49
Anti-knock engine operator	9	9	-	1	2	-	6	-	-	-	-	-
Chemist:												
Analytical	30	24	-	1	-	-	23	6	-	6	-	-
Anti-knock	2	2	-	2	-	-	-	-	-	-	-	-
Gas analysis	6	3	-	3	-	-	-	3	-	-	3	-
Micro-	1	-	-	-	-	-	-	1	1	-	-	-
Problem	4	4	-	4	-	-	-	-	-	-	-	-
Research	48	29	-	12	13	-	4	19	13	6	-	-
Specialty	6	-	-	-	-	-	-	6	6	-	-	-
Computer	23	-	-	-	-	-	-	23	-	-	11	12
Development engineer	1	1	1	-	-	-	-	-	-	-	-	-
Draftsman	55	3	-	-	-	-	3	52	2	1	24	25
Equipment washer	21	21	2	-	-	-	19	-	-	-	-	-
Experimental helper	17	-	-	-	-	-	-	17	17	-	-	-

Table III (Continued)

Occupation	All establishments	Refineries						All Other Industry Divisions				
		All Districts	Petroleum Administration for War District					All Districts	Petroleum Administration for War District 2/			
			I	II	III	IV	V		I	II	III	V
Glass blower	1	1	-	-	-	-	1	-	-	-	-	-
Inspector	74	73	18	9	-	-	46	1	1	-	-	-
Laboratory analyst	4	-	-	-	-	-	-	4	-	-	4	-
Laboratory assistant	86	64	20	1	43	-	-	22	5	-	9	8
Laborer	12	4	-	-	4	-	-	8	8	-	-	-
Machine operator:												
Blueprint	8	6	-	-	4	-	2	2	2	-	-	-
Photostat	6	3	-	-	2	-	1	3	1	-	2	-
Reproduction	4	1	-	-	-	-	1	3	3	-	-	-
Measurement engineer	1	-	-	-	-	-	-	1	-	-	1	-
Micro paleontologist	3	-	-	-	-	-	-	3	-	-	2	1
Pilot plant operator	16	16	-	-	-	-	16	-	-	-	-	-
Photographer	2	2	-	-	-	-	2	-	-	-	-	-
Research assistant	2	2	2	-	-	-	-	-	-	-	-	-
Research mechanic	3	-	-	-	-	-	-	3	-	3	-	-
Sample girl	15	14	-	3	-	-	11	1	-	-	1	-
Technical assistant	2	2	1	1	-	-	-	-	-	-	-	-
Technician	65	52	-	1	30	-	21	13	1	2	-	-
Technologist	7	6	-	-	-	-	6	1	-	1	-	-
Tester:												
Analytical	7	7	5	1	1	-	-	-	-	-	-	-
Oil	4	-	-	-	-	-	-	4	-	-	1	3
Physical	102	102	3	-	38	-	61	-	-	-	-	-
Routine	83	83	52	-	18	-	13	-	-	-	-	-
Not specified	192	161	22	62	37	22	18	31	31	-	-	-
Maintenance, total	189	155	16	41	52	3	43	34	6	-	3	25
Bus driver	2	2	-	2	-	-	-	-	-	-	-	-
Canvasman	1	1	-	-	-	-	1	-	-	-	-	-
Charwoman	4	4	-	-	4	-	-	-	-	-	-	-
Crane operator	1	1	-	-	-	-	1	-	-	-	-	-
Garage floorman	6	-	-	-	-	-	-	6	-	-	-	6
Helper:												
Boilermaker	2	2	2	-	-	-	-	-	-	-	-	-

Table III (Continued)

Occupation	All establishments	Refineries						All Other Industry Divisions				
		All Districts	Petroleum Administration for War District					All Districts	Petroleum Administration for War District 2/			
			I	II	III	IV	V		I	II	III	V
Carpenter	2	2	-	-	1	-	1	-	-	-	-	-
Electrician	5	5	-	1	-	-	4	-	-	-	-	-
Instrument repairman	22	22	1	3	18	-	-	-	-	-	-	-
Machinist	4	3	-	1	-	-	2	1	-	-	1	-
Mechanical	28	28	1	16	1	-	10	-	-	-	-	-
Pipefitter	1	1	-	-	-	-	1	-	-	-	-	-
Salvageman	2	2	-	2	-	-	-	-	-	-	-	-
Tool room	6	6	-	2	-	-	4	-	-	-	-	-
Instrument repairman	1	1	-	-	-	-	1	-	-	-	-	-
Janitress	79	57	12	13	21	3	8	22	6	-	-	16
Laborer	10	8	-	1	7	-	-	2	-	-	2	-
Painter: drum, tank, pipeline	3	3	-	-	-	-	3	-	-	-	-	-
Tool repairman	2	2	-	-	-	-	2	-	-	-	-	-
Tool stockman	2	2	-	-	-	-	2	-	-	-	-	-
Truck driver	3	1	-	-	-	-	1	2	-	-	-	2
Valve repairman	2	2	-	-	-	-	2	-	-	-	-	-
Weed cutter	1	-	-	-	-	-	-	1	-	-	-	1
Other, total	460	76	30	17	26	3	-	384	74	4	3	303
Cafeteria manager	1	1	-	1	-	-	-	-	-	-	-	-
Cafeteria helper	15	15	13	1	1	-	-	-	-	-	-	-
Cook	14	14	4	5	5	-	-	-	-	-	-	-
Counter girl	9	5	5	-	-	-	-	4	-	4	-	-
Elevator operator	13	1	-	1	-	-	-	12	-	-	-	12
Entertainer	2	-	-	-	-	-	-	2	-	-	-	2
Hospital technician	1	1	-	-	1	-	-	-	-	-	-	-
Housekeeper	1	-	-	-	-	-	-	1	-	-	-	1
Maid	4	2	-	-	2	-	-	2	-	-	-	2
Matron	1	1	1	-	-	-	-	-	-	-	-	-
Nurse superintendent	1	1	-	-	1	-	-	-	-	-	-	-
Nurse	37	33	7	7	16	3	-	4	1	-	3	-
Service station manager	110	-	-	-	-	-	-	110	12	-	-	98
Service station attendants	245	-	-	-	-	-	-	245	61	-	-	184
Waitress	6	2	-	2	-	-	-	4	-	-	-	4

1/ Since company designations were generally followed, some jobs may appear under more than one title. In several instances, the reported job titles have been modified to reflect the substitution of females for males.

2/ District IV is omitted since no women are reported in Replacement Schedules received from divisions other than refineries.

3/ Includes centrifuge, filter-press, extractor, retort, and other operators.

4/ Includes senior clerks in all categories.

OCCUPATIONS

PROFESSIONAL & TECHNICAL - 1943

MVR - 1571

May 1, 1943

COLLEGIANA - 1943

PURPOSE:

1. To call the attention of employers to the availability of 69,000 young women who will be graduating from the schools and colleges of the United States before September 30, 1943.

2. To inform these young women of the opportunities open to them to use their special abilities and training in the war program.

3. To publicize the activities and services of USES; the National Roster of Scientific and Specialized Personnel; U. S. Civil Service; ESMWT courses (Bureau of Training, WMC and U. S. Office of Education).

THE SITUATION: According to current estimates of the National Roster, 69,000 seniors and advanced students will be leaving the colleges and universities of the United States before September 30, 1943, and will be available for employment.

They represent a new and untapped source of supply--one that is mobile, intelligent, young, energetic, strong and healthy.

What are they prepared to do in the war program?

How many of them can be absorbed into the labor market for trained personnel?

See attached memoranda giving data on SUPPLY and DEMAND.

The demand for trained technical and professional workers cannot be stated numerically, for obvious reasons. There are, however, shortages which these women alone can fill:

DEMAND

Shortages:

Engineers: Estimated demand..... 40 - 50,000
Men graduating in June 17,000
Positions to be filled ..... 23 - 33,000

122 women expected to graduate this year

Doctors, dentists, nurses, veterinarians: unlimited numbers

Teachers: High Schools and colleges (physics) 2,000
Elementary and secondary schools 10,000 vacancies now

Social Workers: in community services, including corrective work, youth organizations, Red Cross 12,000

Industry needs 3 to 10 times the available supply of engineers, physicists, and production supervisors.

Medical and Health Fields 5000-10,000 needed immediately
- Occupational Therapy
- Physical Therapy
- Medical & Psychiatric Social Workers
- Technical Personnel in Hospitals

Transportation
- Railways, Airways, Trucking, buses, etc. 140,000

JOB DEMAND FOR COLLEGE WOMEN

GROUP A: TECHNICALLY TRAINED: The demand will be greater in the next few months than ever before in the history of the United States. Many colleges report an increase of 100% since the war started.

DEMAND UNLIMITED

Physics
Mathematics
Chemistry
Engineering
Drafting
Medicine
Nursing
Office Work
Accounting
Auditing
Teaching (Secondary and Elementary)
Social Work
Dentistry

GREAT DEMAND

Bacteriology
Economics (Statistics, Labor Analysis, etc.)
Dietetics
Immunology
Languages (Asiatic, African, Slavic, Scandinavian, Portuguese)
Library (Special, such as Medical, etc.)
Map Making (Cartography)
Medical Techniques
Metallurgy
Meteorology
Nursery Schools
Nutrition
Occupational Therapy
Oil Geology
Pathology
Pharmacy
Photography
Physical Education
Physical Therapy
Psychology (Social work, mental hygiene, etc.)
Public Administration
Public Health
Recreation

LESSER DEMAND

Agriculture
Architecture (except drafting)
Astronomy (Celestial Navigation)
Commercial Art
Journalism
Editorial
Public Relations
Economics)
Geography)Except as secondary or in combination with other subjects, or teaching
History)
Languages)

Law
Public Administration
Radio (Production and Engineering)
Motion Pictures (Photography and Production)

GROUP B: NON-TECHNICAL FIELDS: Civilian Services...Workers needed in every community

Communications: Telegraph and telephone; teletype; radio
Transportation: Information; Chauffeurs; mechanics; clerks and dispatchers; conductors; trainmen; traffic clerks.
Agriculture: Dairy; poultry; harvesting; food processing; packing
(Health and Welfare Programs for War Workers: Managers; clerks;
(Child Care Centers: laundresses; cooks; mothers' helpers.
Community and Personal Services for War Workers: Shopping; housecleaning; foster-care of young children; receptionist; clerk; inspector in housing and information centers for war workers.
Education: Clerical and janitorial workers
Hospitals and Clinics: Receptionist; attendant; assistant in doctor's and dentist's office; clerical work.
Publications and Printing: Linotype operator; proof reader
Retail Trade: Sales clerk; buyer; cashier; bookkeeper; stock-girl
Restaurants, Cafeterias, Hotels, Boarding Houses: Housekeeper; supervisor; steward; food buyer; cook; waitress; switchboard operator; room clerk; manager; hostess; counter attendant.
Laundry and Dry Cleaning: Spotter; dyer; checker; sorter; marker; inspector; supervisors
Service Trades: Tailors, plumbers, carpenters, electricians

SUPPLY -- REGISTRATION OF WOMEN STUDENTS IN COLLEGES AND UNIVERSITIES OF THE UNITED STATES EXPECTED TO GRADUATE BEFORE SEPTEMBER 30, 1943 -- listed by major subjects of study. (Figures compiled by the NATIONAL ROSTER....representing about 90 per cent of the total.)

GROUP A: Great number of openings for those who have training in these fields

SUBJECT	GRADUATE STUDENTS (50% of total)	SENIORS	
Accounting and Auditing	26	327	
Agriculture	27	159	
Architecture (drafting)	5	111	
Business	486	5,427	
Dentistry	67	121	
Education	3,593	13,489	
Engineering	17	105	
Hygiene and Public Health	67	477	
Medicine	80	235	
Nursing	142	3,036	
Nutrition	83	857	
Pharmacy	5	189	
Physical Education and Recreation	181	1,559	
Public Administration	140	115	
Social Work	1,459	1,208	
Veterinary Medicine	6	10	
Totals:	6,384	27,425	
Grand Total:			33,809

GROUP B: Limited number of openings for those who have training in these fields--more if they take supplementary courses in other fields.

SUBJECT	GRADUATE STUDENTS (50% of total	SENIORS	
Economics	263	1,376	
Geography	32	161	
History	417	2,686	
Home Economics	461	6,872	
Natural Science	377	497	
Psychology	334	1,541	
Totals	1,884	13,133	
Grand Total:			15,017

GROUP C: Limited number of openings for those whose training has no obvious relation to the immediate demands of the war program for technical personnel.

Fine Arts and Languages	2,066	15,047	
Law	36	217	
Other Major Fields	292	546	
Not yet majoring		1,289	
Totals:	2,394	17,099	
Grand Total:			19,493

GROUP A	33,809	Total, March 9, 1943	68,319
GROUP B	15,017	Estimated, May 1, 1943	683
Total	48,826		69,002
GROUP C	19,493		

REGISTRATION OF WOMEN STUDENTS IN COLLEGES AND UNIVERSITIES OF THE UNITED STATES expected to graduate before September 30, 1943--listed by major subjects of study.

Figures compiled by the NATIONAL ROSTER are based on returns to a questionnaire distributed by the National Roster of Scientific and Specialized Personnel. Schedules were sent to all universities, colleges, professional and technical schools, teachers' colleges, normal schools, and junior colleges listed in the 1941-42 Directory of the U. S. Office of Education, and to certain unlisted institutions which appear to fall in one of these categories. Approximately 1,85 0 schedules were distributed and on January 15, 1943, 1,423 usable returns had been received. This number includes replies from 692 colleges and universities, 137 professional and technical schools, 172 teachers' colleges, 35 normal schools, and 387 junior colleges. In addition to these, 90 schools returned unusable schedules. Since this tabulation was made, 148 replies have been received. These replies will be included in a subsequent report.

Complete returns will be available May 1. Data on numbers of students by states available by May 4.

(Note) Data on nursing enrollments apparently include many student nurses not pursuing courses of collegiate grade.

(Note) Many institutions did not distinguish pre-professional students from other undergraduates. The distribution of pre-professional students by "expected dates of graduation" are of doubtful significance in view of the varying periods of training required for admission to professional schools, and in view of the fact that a large proportion of these students enter professional schools without first receiving academic degrees.

Return to RSN

Eva Hansl Notes for a Talk to the Graduate Students of Catholic University
Thursday, May 6, 1943. 1 PM. McMahon Hall

COLLEGE GRADUATES AND THE WAR

War means work. There is no place for leisure in a war economy.

War means dislocation--of homes, of community life, of careers, of plans for the future. Adjustments to war are individual, as well as national. Not a person in the country but is affected by the transition from peace to war--nothing is as it was before December 7th and many factors in our lives will never be the same as we knew them, even after the armistice is signed.

War means that women must replace ~~the~~ men ~~who go to war~~ in practically every occupation and fill many of the ~~places~~ new jobs produced by the expanding war industries. They must, also, keep the home fires burning--even more brightly than ever before. For many of us it means a dual job--one inside and one outside the home. (According to the latest report of the Women's Bureau of the U. S. Department of Labor 50 per cent of the women working in war plants are married and have home responsibilities.)

Let me review with you, briefly, what happens when women's occupations transfer from peace to wartime. War causes great shifts in our population, less, perhaps, from place to place than from occupation to occupation and less among women than men because most of the traditional occupations of women continue even in a war economy. But great shifts in the womanpower of the United States are ~~taking place~~ going on, from home to market ~~place~~, from one type of job to another within a trade; from one occupation

to another. The situation is like a vast jig-saw puzzle. At first, all the little pieces are in a scramble; gradually the finished picture emerges. It is the manpower problem to fit the occupational jig-saw pieces into a finished picture of the labor economy of a nation at war.

The Bureau of Labor Statistics, U. S. Department of Labor, and the Bureau of ~~Employment Security~~ Placement of the War Manpower Commission have estimated that 18,000,000 women will be employed by the end of this year. This means 7,000,000 more than were registered in the last census and, because we are now at war, it means that women are working not only in their traditional fields, but in practically every occupation.

Although men vastly outnumber women in most of the 451 occupational groups listed by the Census in 1940, there are only 9 which employed no women at all, at that time. These were: in railroading--conductors, baggagemen, locomotive engineers and firemen, car shop mechanics and reaprimen, brakemen, and switchmen; besides that, in the armed forces: soldiers, sailors, marines, and coast guards. In railroading there are now some women performing each of these functions listed, and it is expected that a total of 180,000 women will be added to the payrolls of all transportation companies this year. And the formation WAACS, WAVES, SPARS, WIRES, MARINES has certainly brought our women right into the armed forces.

In 1940, the occupation employing the largest number of women was that ~~group in which the greatest shift from peacetime to wartime work is taking place~~ of private family servants. It requires no statistician to show how rapidly this group in which the greatest shift from peacetime to wartime work is taking place.

As much of the housework of women went out of the home to be performed in public eating places, laundries, canneries, and hotels, women began to go out with it. But though these "domestic service" occupations are traditionally women's work, at least 10 per cent of those engaged in them were men--chefs, waiters, elevator operators, laundrymen, icemen, etc. As these men are drafted into the armed services, their places will have to be filled by women or the establishments will have to close. This means not only a loss of business to the owner and his employees but serious dislocation in the life of the community. It means that people who work full time on a war job will not be able to keep on working if they cannot have their clothes laundered and cleaned; a place to eat and the stores open so that they can do their shopping on the way home from work. It means that the recruiting program of the War Manpower Commission, particularly among housewives whom it is trying to bring into the war program, will be dangerously hampered by this lack of services and this means that our war production cannot be carried forward to meet the needs of our armed forces. The situation brings to mind the piece we all learned in our childhood--remember? "For the want of a nail, the shoe was lost." Well, here is a paraphrase ~~the War Manpower Commission~~ which might use ~~to~~ to describe this vicious sequence of events: "For the want of a laundry, the war worker stayed home; for the absence of the war worker, the bomb-site wasn't made; for the lack of the site, the plane wasn't finished; for the lack of the plane, the transport was sunk."

I cannot emphasize the importance of these essential civilian services too strongly. Figures recently cited by the Women's Advisory Committee

of the War Manpower Commission show that of the 18 million women who will be working by the end of the year, fully two-thirds will be needed in civilian trades and services, such as communications, transportation, agriculture, child-care centers, education, medical and health care; retail trade, laundry and dry cleaning; clerical work and service or repair trades. In all these occupations, there are posts for the college-trained woman--either in technical jobs or in executive and supervisory positions or right on the production line.

Occupational functions of the homemaker which have gone out of the home to become "professionalized," so to speak, are teaching, nursing, and social work. In all of these, women have been in the great majority--and there are tremendous shortages--50,000 teachers; 113,000 graduate nurses, 12,000 social workers, in community services alone. Not only have women in these fields been lured away by better earnings or more drama in what may seem "greener pastures"--but the need for these services has greatly expanded as the war advances on more fronts--and the social and health problems induced by migration and congestion of population here at home become intensified. Furthermore, women must now also replace men who were formerly engaged in these specializations--teachers of physics, manual training, physical education; public health officers, laboratory technicians, court attendants, police officers--to name but a few.

Since the day when the telephone and telegraph were invented, women have practically had a monopoly as operators, serving the public. From earliest Colonial times, they have been appointed as postmistresses. As the war expands these communication activities, the demand for women will increase. It has recently been stated that 15,000 postal clerks have

gone to war. They will have to be replaced. So will telegraphers in railroads, engineers in broadcasting stations. Radio transmission, being much more technical an operation than clicking a key or plugging a switchboard, has heretofore been, largely, a man's occupation. But the women's auxiliary services of the Army and Navy, especially the WIRES in the Signal Corps, are seeking women whom they can train to become radio operators. The WAVES maintain a Specialists' School in Radio at Madison, Wisconsin. Recent announcement from Purdue University tells us that they have started a 10 months' intensive course to prepare 87 girls as radio engineering cadettes for the RCA-Victor Division of the Radio Corporation of America. Sixty-five of this first group of students were chosen from among 500 candidates in 45 colleges in 18 States. The other 23 were selected from RCA plants where they had been working in the factories and offices. This selection is a telling illustration of the attitude of industry towards the college girl as an employee--straight out of the laboratory, she may not be as useful to them as the girl who has worked in the shop and added technical, theoretical training to her practical experience.

There are other similar projects to train engineering aides or cadets, for aircraft companies to help ease the tremendous shortage of graduate engineers. ~~This shortage can be expressed~~ When you know that the Armed Forces and Industry ~~have~~ need between 40,000 and 50,000 ~~jobs to fill~~ this year; that there will be 17,000 men graduating from accredited engineering schools and only 122 women, you can realize how acute this sitattion is--especially in a mechanized war such as we are fighting today. Engineering represents 75% of the professional jobs in the war program. About 15-20% as many chemists as Engineers are needed.

"The shortage is serious and dangerous," according to George W. Bailey, Secretary of the Committee on Scientific Personnel of the Office of Scientific Research and Development. "The supply of scientifically trained men is practically exhausted. An adequate supply of scientifically trained women DOES NOT EXIST." The two causes for this shortage most frequently cited are: (1) that World War II followed immediately upon a Depression Era when women were discouraged from specializing in science because they were told there were no positions open to them, not even in teaching in these fields, and (2) the traditional attitude of women towards themselves, their daughters and their pupils, that "they can't deal with figures." As Dr. Gillie A. Larew, Acting Dean of Randolph Macon Women's College said at a recent conference on "College Women and Industry" held in Washington by the American Association of University Women, "I should like to say to the parents of this country: "If you believe that your daughter is capable in mathematics and the physical sciences, her chances of being capable are increased by about 100%." To confute this skepticism of women's mathematical ability, Dr. Earl Lark-Horovitz, Head of the Department of Physics at Purdue University, said, at this same conference: "Physical science aptitudes, when given to women students at Purdue and to women and men from industry at Pennsylvania State College, showed that the college woman, even though not primarily interested in the sciences, is better material for training in this field than the average man from industry, because of her background, education, and personality."

In this "race of education with catastrophe", as H. G. Wells called it, the colleges are well aware of their responsibility. With the cooperation

Substitute in Hansel speech

of the Bureau of Training of WMC and the U. S. Office of Education, 222 colleges and universities in all parts of the country are offering free, short-term courses in Engineering, Science, Management War Training (known familiarly as ESMWT courses) in 1000 towns and cities. These courses are related directly to the college level training needs of local industries and are correlated with the war production activities of the time and the place where they are offered. The demand, particularly, for women "is becoming so heavy and specific that no doubt little difficulty ~~is~~ will be experienced in placing those who have mastered the courses." ESMWT anticipate the need by July 1944, for thousands of technically trained workers for industry and the Amred Forces. The goal of the Bureau of Training is to supply these people for Industry.

There are already many college-trained women being sent by their employers to take ESMWT courses in order to increase their value to the industry and to be "upgrades" in their jobs.

ESMWT courses are offered in addition to the regular work which the colleges are doing in turning out professional and pre-professional technically trained workers.

The Training-Within-Industry Division of the Bureau of Training aims to assist one million foremen in increasing their skills in job instruction, job methods, and job relations. Up to the present time most of the war plant foremen have been men but it is expected that marked changes will occur shortly, due to the shortage of men, which will bring many more women into war plant supervisory jobs. For this training women will be selected on the basis of their natural inclinations for war production work andleadership abilities, and will be trained to meet plant requirements.

of the U. S. Office of Education and the Bureau of Training of WMC, 222 colleges and universities in all parts of the country are offering free, short-term courses in Engineering, Science, Management War Training (known familiarly as ESMWT courses) in 1000 plants. (~~See memo attached~~) These courses are related directly to the college level training needs of local industries and are correlated with the war production activities of the time and the place where they are offered. The demand, particularly, for women "is so heavy and specific that little difficulty is experienced in placing those who have mastered the courses." They anticipate the need by July 1944, for 800,000 technically trained workers for industry; 250,000 for the Armed Forces and that 500,000 to 600,000 of these will have to be women. The goal of the Bureau of Training is to supply those people for Industry; of the Division of Training-Within-Industry to provide one million foremen trained as instructors. Until now these foremen have been men with but the increasing employment of women in war plants, it is expected that more and more women will be trained for supervisory jobs within the plants--a goal for the college woman who begins on the assembly line--the only place where the new graduate can begin if she is not trained in math or sciences, accounting and auditing. There are already many college-trained women sent by their employers to take these supplementary courses in order to incr ase their value to the industry and to be "upgraded" in their jobs.

These courses are in addition to the regular work which the colleges are doing to turn out professional and pre-professional technically trained workers.

Although the greatest number of openings for college-trained women, today, is for the smallest group already prepared to practice in the fields of medical and physical science, there are equally great demands for the services of college women in other lines of work. All scientific work, from anthropology to zoology, is becoming increasingly important in the war program, as the theaters of war open up in new countries whose customs, geography, climate, food production we must know in order to wage effective warfare.

There are jobs waiting for girls who have majored in agriculture, accounting and auditing; in physical education and public health, in social work, public administration and education (provided they will teach in elementary and secondary schools and do not seek administrative posts right away). In high schools and colleges, the openings are for those who can teach math and physics (there are 2000 openings in this field alone), chemistry, agriculture, nutrition, and vocational guidance. For teachers in the liberal arts field, the opportunities are closing down, except in history and geography.

Architects are much sought after, because they can do drafting and so help design airplanes and ships. For graduates of business schools, the advice is the same as the manufacturers give to college women who want to go into industry: "Don't look for administrative, executive, supervisory, or personnel jobs until you have learned the ropes. Begin at the bottom and see how fast you can get to the managerial positions."

There is a special group of subjects about which I want to tell you in some detail because the need for women is already acute and will

continue to increase as the war progresses and our men return wounded from the battlefield. They are: occupational therapy; physical therapy (or physiotherapy, as it often is called); psychiatric and medical social work, and hospital techniques. The Professional and Technical Service of the Bureau of Training of the War Manpower Commission, in a recent report, estimated the ~~demand~~ immediate need for women trained in these fields to be ~~nearly 30,000 for this year alone~~ between 5 and 10,000. As so many of you, here at the Catholic University, are specializing in social work and nursing, I am going to take ~~a little~~ time to describe these five fields in a little more detail than the others:

Occupational Therapy, as you know, is "any activity, mental or physical, prescribed by a ~~physical~~ physician for its remedial value to improve health and supply normal activity." It combines the creative arts, recreation, education, and pre-vocational activities. Its purpose is to restore a patient to be able to take his place in normal life; to give him a healthy outlook on life and a means of self-support. There are 6 approved schools and courses given at 5 other colleges, among which Mount Mary College in Milwaukee ranks very high. The requirements are 9 to 18 months' practice training after at least 100 weeks of full time training in the biological sciences, theory and practice in orthopedics, tuberculosis and communicable diseases. 600 graduates could be placed immediately in Army and Navy and civilian hospitals; and the Veterans' Administration.

Physical Therapy: the treatment of disease by means of heat, light, water, electricity, and mechanical agents, including massage and corrective exercises. Physiotherapy aides, as this definition would indicate, have usually majored in physical education, anatomy, physiology, and kinesiology.

Like nurses, they are trained to work in cooperation with physicians and to carry out various treatments as prescribed by them. Training consists of 800 hours of theory and 200 hours of practice, followed by 6 months supervised work. Twenty-two approved schools are now giving these courses and ten others are offering short six months' courses. The average fee is $200 and in four schools (State University of Iowa; Mayo Clinic in Rochester, Minnesota; Columbia University, and Cleveland Clinic Foundation) there is no charge. Arrangements have been made with the Office of the Surgeon General of the War Department to give 6 months additional training as apprentice therapy aides in Army hospitals.

Medical and psychiatric social work: Both specialties for college graduates who have had 2 years of graduate work. Of the 42 accredited schools of Social Work, in this country, 14 give special courses in medical and 9 in psychiatric social work. There are 1200 jobs in the former field; 900 in the latter, waiting to be filled this year. The Red Cross wants 400 psychiatric social workers for domestic service; 300 to go overseas. The other positions are in civilian hospitals and clinics; as administrators and field agents in public and private agencies, and as teachers in schools of social work.

Medical Technics: Jobs in these fields are listed as:

Nurse anesthatists
Laboratory technicians
Dietitians
Physiotherapists
Pharmacists
Medical Librarians and Stenographers
Occupational Therapists
Dental Hygienists
and other special workers

There are 20,000 vacancies for full-time and part-time workers in civilian and Government hospitals and public health offices. This shortage has been brought about not only because present facilities must be greatly expanded to take care of the war patients and civilians in the congested areas surrounding war plants, but because great numbers of workers have already been withdrawn into defense industries and into the WAACS and the WAVES to serve the armed forces.

Training in these fields is given in 227 approved schools, 105 of which are affiliated with colleges and universities. Two-thirds of these require two years of college and 15 per cent an A. B. degree. For high school students the training course covers 4 to 5 years. Generally speaking, 12 months of the technical training period must be spent in hospitals.

In Government hospitals and agencies, all these are Civil Service jobs.

So much for this special group of medical techniques, crying out for your services.

Now, what about the other fields in which some of you have been majoring?

For the economist, the psychologist, the home economist, and majors in geography and history, there are few "ready-made jobs" until "something new is added" to their training to make them more immediately useful, that is, employable. If the biologist and botanist will turn to bacteriology and pathology, for instance, the economist will specialize in statistics or labor analysis, and the home-economist will take additional courses in nutrition, their value to the labor market will be greatly enhanced, as will their services to their country. The need for geographers and historians is greatest in the

class-rooms where the future of the world depends upon the understanding by our new crop of citizens of the changing map of history.

The traditionally preferred studies of women have been in the liberal arts subjects--fine arts, languages, music, the social studies. In times of war, these are, unfortunately, not as important as in times of peace. Teachers in all these subjects, especially in the languages of our allies and enemies, will be greatly needed. But for translators, for propagandists and propaganda analysts, the posts are already pretty well filled. Artists cannot be turned into camoufleurs without some training in engineering; nor are there many jobs for sculptors who would be model-makers. Although many men are being drafted from radio and motion picture studios, women will not have much chance to replace them in the more desirable positions until the last 4-F has been employed, they tell us!

You face a disjointed world to come out into from the shelter of your beautiful college halls--a world of work and little fun; a world in which you will have to learn to get along without men and to get along with women; a world of anxiety, grief and ~~xxxxx~~ sorrow to which you will have to bring all you can muster of courage, serenity, humor, wisdom, and spiritual strength.

But one thing will not be difficult--and that is to find work, especially ~~if you~~ for girls who have been guided so wisely and trained so well in technical fields as have you young women of Catholic University.

You young women graduating into the labor market this spring and summer constitute the largest untapped reservoir of technical labor in the country. Employers are weaving daisy chains of welcome for you, standing at your gates with jobs to exchange for your sheepskins. According to figures recently compiled by The National Roster for Scientific and Specialized

Personnel of the War Manpower Commission, there are 69,000 of you. 33,809, or almost half of your number, have been majoring in the subjects for which there is the greatest demand, that is, mathematics, the physical and medical sciences, accounting and auditing, teaching, and social work. There are four jobs waiting for every MA in Physics; at least 10 for a math or physics major who will take additional training to become an engineering aide. Chemists can be choosers of jobs, as can nutritionists and dietitians.

~~Then, there is another~~ For the group of some 15,000 seniors and graduates who have majored in economics, geography, history, home economics, the natural sciences, and psychology, ~~For these~~ there is a lesser demand. ~~until something new is added to their knowledge. For instance, the biologist who turns herself into a bacteriologist; the home economist who will become a nutritionist; and the psychologist who will add social case work to her equipment will find themselves in much greater demand than if they stop where they are.~~

The third group is made up of ~~is made up of the arts students~~, some 17,000 in all-- ~~the~~ linguists, ~~the~~ musicians, ~~the~~ writers, lawyers, artists and actors. The relation of these majors to the war is not so obvious and the positions they may find will be much of their own making. By combining what they know with subjects more in demand or with what they did in their extracurricular activities, some of them may find opportunities in recreation, in public relations, in hotel work, communications and transportation, news-gathering and other essential jobs in which they replace men.

The important thing is that you get to work FOR THE WAR.

The ideal to which the War Manpower Commission subscribes is "the right person in the right job," which it tries to carry out through the

services of the U. S. Employment Service in cooperation with the National Roster and the U. S. Civil Service Commission. But TIME is of the essence. And there is so much to be done right away that we must all make up our minds to get to work right away for our country at whatever lies nearest, and leave our personal interests to the future. The question is not "What will this job do for me?" but "What can I, in this job, do for my country?"

War has always brought women great opportunities for themselves and for service to their country. This ~~xxx~~ total, mechanized war of today has brought us greater opportunities than we have ever had before and produced them swiftly and suddenly. I have tried to show you how greatly the demand exceeds the supply for college graduates, like you. The reduction of these tremendous shortages for trained women workers depends upon no one but you.

College graduates--both men and women--have been accused of job-snobbery. The draft has cured the men of any such tendency. You women will have to clear your own records and it will not be easy to do because you have a choice of jobs, today, and the great temptation of waiting for something better to turn up. War, however, is no time for waiting. It is a time for action.

The Army and Navy have worked out a plan, in cooperation with the WMC, to use every college man over 18 in the war program where he can render the best services of which he is capable. ~~Women will probably not be drafted.~~ There is no "directive" for college women as to their place in the war. Women students in England are required to take useful courses qualifying within a

reasonable length of time for posts in the professions and sciences which need new recruits during the war. Under the British regulations, women students are expected to complete their university studies in the year in which they become twenty years of age. They can secure exemption from war work to take a longer course if they are qualifying as teachers, doctors, dentists, or if they are going on to an approved course of post-graduate professional training for which they have been recommended. But in this country, ~~every college and~~ every college student and graduate will have to find her own place where she can make her most effective contribution. We believe in the democratic process; we have our opportunity to demonstrate to the Axis that it works. ~~But if you don't make the most of that opportunity, the women of this country will also have to be drafted.~~

This war ~~belongs to~~ is the responsibility of your generation. My generation muffed the chance of our lifetime. As soon as ~~the war was over~~ peace was declared, we threw our hats over the moon and many of our standards with it, and had us a good time with our postwar prosperity. There will be prosperity again--but not unless the United Nations win this war, and not until we have built up this war-ridden world. Because the Americas are not a battlefield, we shall be a strong and healthy people who must give of our great resources, material and human, to the rest of the world. We women do not have to wait until the end of the war to begin our work of reconstruction, for ours is the privilege to construct in the midst of destruction.

All power to you!

MVR

Magazine Bureau
Office of War Information
Social Security Building
Washington, D. C.

August, 1943

PUTTING THAT COLLEGE EDUCATION TO WORK

The situation of the college woman today might be summed up in these words: unprecedented opportunity, unprecedented obligation.

From all sides comes the clamor for her services. She is asked to join the WACS, WAVES, SPARS and WOMAN MARINES. The war industries issue recruiting pamphlets to tempt her to come into their plants. It takes a 77-page booklet (Civilian War Service Opportunities for College and University Students) for the U. S. Civil Service and the American Council on Education to list her opportunities in the federal civil service. Fourteen vocational fields are included in this text: accounting, administration, agriculture, economics and statistics, engineering, home economics, industrial arts, industrial management, law, library work, medicine and related fields, physical sciences and social work. The Smith College Vocational Office has issued a pamphlet, College Women in War Work, listing employers seeking the services of the graduating class. Positions available to inexperienced candidates were listed in more than 30 occupations.

It is the duty of the woman graduate to take a job in which she can help to win this war. She can do no less for the country which made her college degree possible. Had she lived in an Axis country, she would have had no hope either for education or career. If she can find work in line with her college major, fine! If not, the patriotic course is to take a place in the ranks--even as her drafted brother has done.

The modern girl reads magazines expecting to be guided in the solution of her problems. Editors who understand supply and demand in the specialized labor market for the college career girl may be of great help both to their readers and to the war program.

Job Supply and Demand: The War Manpower Commission estimates that 3½ million people must be added to the labor force this year. Of this number, approximately 2 million will be women. It is obvious, then, there is work waiting for all of the approximately 76,000 women who will complete regulation college courses or post graduate courses in 1943. They are a reservoir of "bright young things" who have had unusual advantages. Manufacturers look to them for technical help in getting out their war contracts. Educators ask them to help keep the schools running. Librarians want their assistance in serving an information-hungry public. Instead of having to work and scrimp and save for a little added technical education, the college girl of today may find free training at many colleges and universities in specialized war-connected fields under the Engineering, Science, Management War Training Program of the U. S. Office of Education. In courses varying from six weeks to six months, she may sharpen her special skills. In addition, some industries have set up

their own systems of training, sometimes in cooperation with accredited colleges and universities. In these courses conducted by industry, some companies in specialized industries where the labor supply is very short may even pay trainees during the learning period.

The home woman with a college education, unless she has young children, has her opportunity and her obligation too. She has enjoyed advantages denied to millions of other women the world over. Her training is wanted by her country now. She may reenter her old field, or may take an ESMWT course which will fit her into war industry on the basis of skills acquired in college. She may take a war job in necessary civilian services.

Even the girl in college may by part-time work combine a worth while war contribution with getting an education. Thousands of college girls are doing just that, and gaining both by acquiring practical experience and by earning part of their way through school.

Job Placement: In addition to the familiar placement channels of peacetimes--the United States Employment Service, the college vocational offices, teachers agencies public and private, and professional associations--the war has brought an over-all avenue of opportunity to the professionally and technically trained, the National Roster of Scientific and Specialized Personnel of the War Manpower Commission, located in Washington, D. C.

The Roster: Beginning operations in July, 1940, the National Roster of Scientific and Specialized Personnel, usually referred to informally as The Roster, has piled up approximately 650,000 registrations in 62 professional fields. Best guess as to the number of women is about 18,000 mostly in the fields of economics, sociology, psychology, personnel, mathematics, chemistry, history.

It is estimated that 50,000 specially trained people have been placed in war industries, both in and out of government, or have been put in professional and scientific posts in the armed services, by the Roster. No separate tally has ever been made of women placements, but as many as 150 have obtained positions in the field of mathematics, and as high as 700 to 800 in the field of chemistry.

The invitation for technically-trained women to register with the Roster is wide open. In five critical fields, the Roster requests registration even before college is completed. Students within one year of receipt of a bachelor's degree, and who are majoring in (1) Agricultural and Biological Sciences, (2) Engineering and Related Fields, (3) Physical Sciences, (4) Social Sciences, (5) Administration and Management are asked to fill out a Student Questionnaire. These forms are sent to the colleges and universities, and the cooperation of the faculty is enlisted in getting their promising students to enroll for important war work upon graduation.

For the more highly trained professional, the woman with a master's or doctor's degree, registration with the Roster is through filling out a technical check list in the field in which she has had training and experience. The call to current graduate students is in the following seven groups of fields: (1) Agricultural and Biological Sciences; (2) Engineering and Related Fields; (3) Humanities--only foreign languages majors with Ph. D's are requested to register; (4) Medical Sciences and Related Fields; (5) Physical Sciences; (6) Social Sciences; (7) Administration and Management. Colleges often assist in registering their graduate students with the Roster. Individuals may write the Roster directly and ask for the appropriate check list.

The Roster requires no aptitude tests. It is taken for granted that by the time a girl gets a bachelor's degree in science from an accredited college, she has survived such screening as might have been necessary. A girl with a bachelor's degree in economics is not expected to be an experienced economist--she is placed in a professional grade suited to her training. It is confidently said at the Roster that any woman graduating from college trained in the physical and engineering sciences can be almost immediately placed in war industry. Discrimination has not disappeared, but in many industries and firms, it is disappearing.

The modern business machines, such as are used for census and social security records, greatly facilitate the work of the Roster. The qualifications of each registrant are put on an index card and coded. As job orders come in, the cards are run through the machines to sort out the registrants with the appropriate qualifications. The Roster does not make placements. It simply puts employers in touch with qualified scientific and professional people. Sometimes this means a job close at home. Or it may mean work in a different part of the country. In professional work, there is more freedom of movement around the country than in jobs where great numbers of people are needed.

A few examples: A war research project, highly important, in the vicinity of Washington requires four women with bachelor degrees in chemistry. They are being brought here from different parts of the country. A parachute company in Utah, unable to recruit a new industrial engineer, employed as a trainee a woman who had taken an engineering course while training to be an architect. A woman with a Ph. D. in physics, whose husband is in an Army camp near Washington, registered with the Roster as being willing to take work in her field within travelling distance of the camp. She got it, and was thus able to be near her husband.

A cooperative procedure has now been set up whereby names of technically trained persons who register with USES are immediately sent on to the National Roster if they cannot be placed immediately by the local employment office.

Roster Analysis of 1943 College Graduates: The National Roster recently made a survey of 1943 college graduates, listing by major subjects of study all women who will graduate from college and post-graduate courses before September 30, 1943. This material has been useful in evaluating

this source of labor supply.

Questionnaires were sent to all universities, colleges, professional and technical schools, teachers colleges, normal schools and junior colleges listed in the 1941-42 directory of the U. S. Office of Education. The following figures show the fields in which the approximately 76,000 women leaving college this year were trained, roughly classified as to their chance of getting jobs.

GROUP 1:

SUBJECT	GRADUATE STUDENTS	SENIORS
Accounting and auditing	26	327
Agriculture	27	159
Business	486	5,427
Chemistry	221	1,149
Dentistry	67	121
Economics	263	1,376
Education	2,593	13,489
Engineering	17	105
Geology	28	107
Home Economics	461	6,872
Mathematics	137	1,083
Medicine	80	235
Meteorology	6	9
Natural Science	377	497
Nursing	142	3,036
Nutrition	83	857
Pharmacy	5	189
Physical Education	181	1,559
Physics	49	119
Psychology	334	1,541
Public Administration	140	115
Public Health and Hygiene	67	477
Social Work	1,459	1,208
Veterinary Medicine	6	10
Totals:	8,255	40,067
Grand Total:	48,322	

GROUP 2:

SUBJECT	GRADUATE STUDENTS	SENIORS
Architecture	5	111
Fine Arts and Languages	2,066	15,047
Geography	32	161
History	417	2,686
Law	36	217
Totals:	2,556	18,222
Grand Total:	20,778	

Total: Group 1	48,322
Group 2	20,778
GRAND TOTAL	69,100
Estimated 10 percent increment expected from non-reporting schools	6,910
Estimated over-all total numbers of senior and graduate women students potentially available for employment by September 30, 1943	76,010

Most of the girls in Group 1 should be immediately able to secure employment in their respective fields. A few of those in Group 2 will go into their own fields.

For those not immediately placed, two courses are open: (1) Take specialized training in ESMWT courses which will fit them into jobs in fields of critical need; (2) take one of the hundreds of jobs in necessary civilian services for which added training is not necessary.

ESMWT: The ESMWT courses offered by the Office of Education are designed to meet specific requirements of local situations after consultation with representatives of war industries. Trainees are "screened" on the basis of background and adaptation to possible future employment. Sometimes tests--psychological, aptitude, or general intelligence--are given. Fredquently plants place an order for a definite number of trainees before enrollments are opened. Facilities of the United States Employment Service and of the United States Civil Service Commission are available for placing those who have completed courses. While there is no guarantee of employment, the demand, particularly for women, is so heavy and so specific that little difficulty is experienced in placing those who have completed a course.

Typical Courses for Important War Industries: Because ESMWT courses are set up in accordance with the needs of local industries for college-trained people, courses available to a college graduate will naturally have a direct kinship to the industries of her community. For instance, in a city which has an aircraft plant, there are likely to be courses in aircraft stress analysis and aircraft design. Near steel works, metallurgical courses will assume importance. Typical of courses which serve various industries are those listed below:

Courses Serving Shipbuilding Industries

1. Engineering Aid (Radio)
2. Inspection of Naval Materials (communication equipment)
3. Principles of Radio
4. Pre-Electronic Instructor Training for Women
5. Ship Machinery for Women
6. Ship Piping Layout for Women
7. Hull Ship Construction for Women

Courses Serving Aircraft Industries

1. Aircraft Materials Inspection for Women
2. Airplane Drafting for Women
3. Elements of Machine Design for Women
4. Elements of Engineering for Women

Courses Serving Ordnance Manufacturing Industries

1. Ordnance Inspection for Women
2. Ordnance Engineering Aids
3. Ballistics Engineering
4. Ordnance Safety
5. Elements of Ordnance Machine Design

Courses Serving Explosives Manufacturing Industries

1. Chemistry of Smokeless Powder
2. Chemical Properties of Explosives
3. Fundamentals of Explosives Manufacture

Courses Serving Chemical Industries

1. Chemical Testing & Inspection
2. Quantitative Chemical Techniques for Women
3. Practical Chemical Analysis for Women
4. Introductory Organic Chemistry
5. Food Dehydration Techniques

Courses Serving Mining & Metallurgical Industries (Steel, Aluminum, etc.)

1. Elementary Metallurgy
2. Physical Metallurgy
3. Chemistry of Metals
4. Metallurgical Techniques for Women
5. Metallographic Laboratory Practice for Women

Courses Serving the Rubber Industry

1. Elements of Synthetic Rubber Manufacture
2. Synthetic Rubber for Petroleum
3. Petroleum Chemistry Including Butadiene
4. Modern Rubber Technology & Practice

Courses Serving the Petroleum Industry

1. Petroleum Refinery Engineering
2. Testing of Petroleum Products
3. Chemical Technology for Petroleum
4. Petroleum Engineering

Courses Serving the Army Mapping Program (Civil Service)

1. Military Map Making
2. Use of Surveying Instruments and Surveying Field Procedure
3. Photogrammetry and Interpretation of Aerial Photographs

Courses Serving Activities That Occur Widely Throughout Many Industries

1. Accounting
2. Elements of Engineering
3. Elements of Machine Design
4. Industrial Drafting
5. Inspection Practices
6. Office Supervision
7. Personnel Administration
8. Safety Engineering

ESMWT courses are offered in 222 colleges and universities. Classes easily can accommodate 175,000 persons at any given time. As of April 30, 1943, there were 145,000 trainees of whom 32,000 were women. Courses last from 8 to 27 weeks. Within the next year, a need for from 500,000 to 600,000 trained women is anticipated. Facilities for training that many women will be available.

Industries Training on the College Campus: For the girl with from one to three years of college work to her credit, a number of industries now offer college campus opportunities to train for specific war work in their plants. Students receive some pay while in training, usually about $10 a week. A few of the many such special opportunities opened to women as the result of the war are given here:

Outstanding women who have completed their junior year in college may receive eight months intensive training in aeronautical engineering at New York University under formal contract with the Chance Vought Aircraft Company which includes an option on the student's services for one year after completion of the training course. These students do not necessarily lose their college degrees, as arrangements may be made to transfer their New York University credits to their original colleges.

Curtiss-Wright Corporation, one of the few aircraft companies which manufactures all parts of a plane, the engine, the propeller, and the aircraft itself, has created a ten months' course for Engineering Cadettes--college girls who have completed the sophmore year. A hundred such Cadettes will be trained in each of eight universities--Cornell University, Iowa State College, University of Minnesota, Northwestern University, Purdue University, University of Texas, Pennsylvania State College, and Rensselaer Polytechnic Institute.

One year of college work is the pre-requisite of the RCA Engineering Cadettes, training on the campus of Purdue University, Lafayette, Indiana. Their course, which runs 44 weeks, includes radio laboratory, industrial orientation, production processes, mathematical problems, electronics, elementary electricity, and electrical drafting. The booklet sent out to help recruit them gives tantalizing glimpses of the world after the war in which they may be playing a creative role. Theatre television is awaiting the end of the war for further development.

Thermal radio--heat produced by radio waves--has been developing and will undoubtedly be an important post-war product.

The Grumman Aircraft Company, at Bethpage, Long Island, has an intensive training course for college women selected on the basis of tests and interviews. First comes a 9 weeks' training course at Columbia University. Next the students enter a 4 weeks' course at the Freeport State Aviation School, working on shop methods and mechanics. They finish with three months in the Grumman plant. Here she spends one week in each key department, and one month of specialization in the department of her choice.

On the West Coast, Boeing Aircraft Corporation and Consolidated Aircraft Corporation have made arrangements for three months courses in drafting and technical calculations for women in the schools of engineering at Oregon State College and Stanford University.

The U. S. Weather Bureau in cooperation with the Civil Aeronautics Administration has sponsored 9-month courses in meterology for women airplane pilots in Massachusetts Institute of Technology, University of Chicago, California Institute of Technology, University of California and New York University.

Various college training courses are offered by the War Department for civilian personnel in Ordnance, Signal Corps, Army Air Force, Army Mapping Service, etc. For information on these courses consult the nearest regional Civil Service office or the local USES office.

War Minors: On many campuses, women students who have not chosen as a major a field of learning directly connected with war work are being urged to prepare for active service by taking a so-called war minor. For instance, the Latin scholar or student of medieval literature may choose from war minors such as the following fields: mechanical drafting, statistics, engineering aides, day nursery supervision, public administration, and recreational leadership.

College Combined With Part-Time Jobs: In critical war areas, there is an increasing tendency to combine college courses and part-time war jobs. Hundreds of women students in New England colleges are registered with the USES to help out in industry as the need arises and they can manage part-time work in conjunction with their college schedule. Students at New Jersey State College for Women have been doing a war job at the near-by Johnson and Johnson plant. Shurtleff College, Alton, Illinois, and the Western Cartridge Company there have teamed up to enable young women to pay for their college education by working in the cartridge plant. The plan is for two girls to share a room in the college dormitory, one working at the plant while the other takes a quarter-term collegiate course. At the end of the three months, they trade jobs.

Necessary Civilian Services: The college woman who cannot at the moment find the job of her choice should for the duration take any one of the hundreds of jobs at hand. Schools, retail stores, communica-

tions, transportation, agriculture, welfare services must be kept running. The Magazine Bureau, OWI, prepared a set of 27 Fact Sheets on Women in Necessary Civilian Services, which already have been made available to magazines, and which were also made use of by the War Manpower Commission in the September, 1943 program to rally women for these civilian jobs.

Labor INFORMATION BULLETIN

SEPTEMBER 1943

Labor Day Statement of Secretary of Labor Frances Perkins

American working men and working women, by the millions, are toiling around the clock today that the men fighting the good fight for their country may have the weapons and materials needed to overcome the powers of evil which have so violated the dignity of man and human liberty throughout the world.

They are laboring in factory, on assembly line, in shipyards, arsenals, mines, and on the farms to maintain a production record that never has been equaled in the world's history. They are determined that that record shall be set at higher and higher levels. They are determined to do their full share in the job of winning the war and winning a good peace.

Their determination is identical with the resolve of all the people of the United States and that is why we are overcoming the Axis powers on all fronts and why complete and sweeping victory must ultimately come to the United Nations, bringing with it a new measure of liberty and opportunity for which all people long.

American working people dedicate themselves anew to that cause on this Labor Day of 1943. They have pledged themselves to win the battle of production by turning out in ever increasing numbers the tools of war for our soldiers, sailors, and marines, our medical corps, our flyers and our Allies. They promise, to the enslaved workers of Axis dominated lands, that this production will help to break their shackles and that another Labor Day will find millions of them once again enjoying the blessings of freedom such as is the heritage of American working men and women and for which our people can be so thankful today.

For sale by the Superintendent of Documents, Government Printing Office, Washington, D. C. Price 10 cents a copy; subscription price, 75 cents a year; $1.15 foreign; postage additional outside the United States.

UNITED STATES DEPARTMENT OF LABOR

FRANCES PERKINS, Secretary

Service Industries Lose in Tight Labor Market

Maintenance of essential civilian industries is today one of the Nation's primary manpower concerns. As the normal labor supply reaches the scraping-bottom stage, with war industries demanding still more workers, the civilian services are up against a solid brick wall of huge labor demand and virtually no labor supply. Laundries, restaurants, hotels, and stores must serve an ever-increasing clientele with a labor force that has been rapidly dwindling for almost a year.

Most important of all essential civilian industries are those that maintain the elemental needs of food, shelter, clothing, transportation, and communication. They are the services without which civilian life cannot continue—food stores, dairies, restaurants; hotels and boarding houses; laundries and department and other stores; street railways and bus lines, and telephone exchanges. They are the services which have, with one or two notable exceptions, employed inexperienced labor, paid low wages, offered the most unsatisfactory working conditions, and promised the least job security. In depressions they have abundant labor resources and subsistence-level demand; in boom times they have an inadequate labor supply and huge demands upon their services.

A stable, properly functioning civilian life is necessary to more than just the morale of the individual "home-front fighter." A break-down in Detroit's laundry service means turn-over in the tank factories. Lack of restaurants in Pittsburgh means illness among steel workers. Poor department-store service in Los Angeles means absenteeism in aircraft plants. As civilian services deteriorate, war production lags.

The service industries are employers of women primarily. As a source of livelihood which paid low wages and had little in the way of job security to recommend them, these trades have always used women as a cheap labor market. Though the economic status of women has improved greatly during the past quarter-century, the pool of women workers is still the only remaining major reservoir of untrained, unorganized, and unskilled wage earners. There are, of course, exceptions and new developments brought on by the war. The telephone companies, though never attracting workers because of high wages, have counteracted this by guaranteeing good working conditions—health care, superior supervision, and career prospects for experienced employees. War demands have almost overnight forced grocery stores, which rarely used women except as cashiers, to replace men with women.

In this connection the laundries and restaurants in particular have pointed out that their price levels control wages, and because they are industries which compete with the housewife, who places no value on her own time, such service charges must be kept down. Though this competition with the housewife is diminished in time of war, when millions of homemakers become industrial workers, arbitrary price levels set to stem inflation raise the same barrier.

The War Manpower Commission launched a recruiting campaign this month for women workers in civilian-service occupations. A survey of possible inducements resolves into the simple fact that the only lure will be an appeal to the patriotism of the potential worker. The Manpower Commission recognizes that the most available labor group at the present time is the 4 million urban housewives below the age of 45 who are not responsible for the care of children under 16 years of age. These women, if they have not already gone to work in war production, obviously have not the same need of added income. Their husbands are making good wages, and though they may have been secondary wage earners in the past, they accept higher pay for the family head as a welcome reason for not working themselves. The recruiting program, therefore, must be based on a valid explanation of why they are needed in a wartime labor force outside munitions production.

The war industries naturally have a greater drawing power than the civilian industries for the normal labor force. The chief reason lies in the comparison of the average hourly earnings of 94.4 cents for all manufacturing with those of laundries at 53.4 cents, hotels at 44, retail food at 66.7, and general merchandising at 54.3. These wage conditions, together with increased living costs, higher taxes, and generally unstable residence factors, reduce the labor market for low-paying industries to the unemployed, middle-aged women with no immediate need of high income.

Manpower experts are of the opinion that the United States is now in the second stage of a contracted labor market—industry-wide shortages and shortages of related skills in other industries. The country is on its way to the third stage of a

general labor shortage such as that experienced by Germany in 1938 and Great Britain in 1941, they add, unless battle casualties are low and selective service requirements leveled off. Nowhere is the industry-wide shortage of labor more evident than in the service industries.

Laundries are in the most immediate need of help. The War Manpower Commission has already declared laundries essential in many war-production centers, thus freezing their workers and maintaining a status quo. In spite of this effort 600 laundries in the United States have closed within the past year, and demand on the service grows daily. One group of four laundries in Washington, D. C., employing 1,600 workers in March and April, reported an accession rate of 32 percent and a separation rate of 33 percent. The reasons for turn-over are the old complaints against laundries—heat, accident hazards, poor labor policy. Laundry owners report that women will work 3 or 4 weeks and then quit altogether, returning perhaps in a month or two. Meanwhile laundry piles up as the supply of domestics decreases, more factory workers create more soiled clothing, pre-war home-laundry equipment wears out with no replacements available, and more housewives go into industry.

The restaurants are particular victims of floating labor. Turn-over in some restaurants is as high as 75 percent, the greatest problem being waitresses and kitchen help. A large number of waitresses are wives following their husbands from one army camp to the next and their job tenure is accordingly brief. Lack of male help necessitates women assuming much of the heavy work in restaurants, such as carrying overloaded trays and pushing carts piled high with dishes. Complaints on this score cause a number to quit. Long hours and fatigue result in more resignations.

The telephone companies, which have never been able to find an adequate supply of experienced personnel, are now burdened with a steady loss rate that is expected to continue. Telephone systems in crowded war centers have imported operators from cities that can spare them. Every new recruit must be trained for 3 or 4 weeks and yet the turn-over in one city of 800,000 population is said to average 150 a month. A major source of dissatisfaction in telephone work is the hours—most women do not want to be liable to service at any hour of the day or night. Companies are attempting to offset these factors by a well-integrated program of morale building that includes an educational campaign on the necessity of telephone service to the conduct of the war.

Grocery chains in war centers, hit hard by the draft, have been forced to employ large numbers of women. Reporting a turn-over of approximately 50 percent, stores claim that women recruited thus far are not interested in the job as a job but only as a quick source of ready cash and the basis for future claim to business experience. Employment managers state that quits are caused by petty jealousies, fatigue, and illness—all stemming from the fact that inexperienced women workers without specific economic need cannot adjust themselves easily.

Hotels claim they lose help too fast to keep statistics up to date. Men waiters, most of whom are over draft age, are fairly stable, but kitchen, laundry, and cleaning help is scarce and transient. Department stores find a ready source of labor in school girls and in-migrants, but the schools eventually reopen and the newcomers obtain factory jobs as soon as possible, resulting in a turn-over of 60 or 70 percent.

The experience of these service industries during the past year serves as an indication of the greater difficulties ahead, as, with the pick of workers already absorbed, there remains in the labor market only the least adaptable, least approachable, group of available womanpower. Complicating the problem is the fact that areas of possible recruitment are restricted by concentration of demand in war-production centers, such as Buffalo, Detroit, Seattle.

Though the issue is primarily one of recruitment, the stringency can be lessened by a well integrated plan of job analysis and labor utilization.

The American Institute of Laundering has made a detailed study of laundry jobs on which physically handicapped and older people can be used. Application of this procedure in the tight-labor areas would improve employment conditions, since plants in war production are unable, generally, to use crippled, deaf, and aged women. Utilization of the handicapped in laundry jobs would release able-bodied women for service in other civilian industries such as restaurants, hotels, and retail stores.

In addition to internal adjustments, the civilian industries must have Government aid in order to maintain service. This is now being implemented by the War Labor Board and the Office of Price Administration. In New York City, not a labor-stringency area, WLB has already granted wage increases for laundry workers and the operators are petitioning OPA for a rise in price ceilings. The service trades have been helped also by the War Labor Board's announcement of wage floors in various regions which enable proprietors in low-paying industries to raise wages to a certain level without recourse to the Board. In a large number of cases the wages paid to employees in the service trades have been below this floor.

With the aid of carefully planned recruiting programs, industry-wide studies of jobs and womanpower potentialities, and Government control of wages and prices, the civilian industries can be maintained. The alternative, in the view of all concerned, is decreased production of war matériel and increased problems in other sectors of the labor front.

Women's Employment in Professional or Technical Jobs

Women were reported in various professional or technical jobs in nearly two-fifths of the plants visited early in 1943 by representatives of the Women's Bureau, U. S. Department of Labor. Some of these plants had women as engineers, chemists, draftsmen, and at least one plant reported a woman physicist, another women on time study. A few employers indicated that more women in these professions could be employed if they were available.

In the aircraft-and-parts industry a woman engineer was employed in each of 3 plants and 2 of these had women on drafting. One plant reported 3 women safety engineers, another 3 chemists. In still another were 2 women engineers, 27 metal testers, and 4 physics-laboratory testers.

In a plant making communications equipment there are a woman engineer, a chemist, and one or two on time study. Another such plant employs a woman engineer on plant lay-out, a few as statisticians, two as chemical analysts. Such women are hard to find. The company could use more.

A plant making scientific instruments employs a woman chemist, a physicist, and about eight draftsmen. Another chemist is needed but no woman can be found and a man may be hired. There are four women in the export department translating for South American trade.

In the ordnance field one plant employs 3 women engineers and a draftsman; another 6 chemists, 34 laboratory workers, and an X-ray technician.

An eastern shipbuilding company reports seven women engineers, a rubber-products plant two chemists and some chemist's assistants.

A woman physicist has said, "For laboratory work you need formal training, of course, and in addition you need persistence, patience, and a knack at solving problems—and the most important of these is the knack at solving problems."

This knack of solving problems may be an important factor with the many women being brought into war plants as laboratory assistants, engineering aides, tracers, testers, drafting clerks, and so on. Women can be prepared to do such routine jobs by short intensive courses or by training in the plant itself. For some of these positions high-school girls can qualify. The encouraging thing is that having gained an entrance girls with interest and aptitude, with a knack of solving problems, may go on to better jobs.

An oil-refining plant employed 30 women in the laboratory making routine physical tests. They have proved better on this work than men, so the company believes that it will retain them after the war. They were given 2 weeks' preproduction training in the laboratory, during which time they were paid.

In a small material-testing laboratory of a shipyard three women began work nearly a year ago. One does chemical analysis, one helps to operate machines to test the strength of metals, the third does sand-control work in the foundry. All are college graduates.

In a plant making bomb releases, gyroscope parts, and so forth, women work as junior laboratory chemists, junior research engineers, X-ray technicians, analytical chemists, and black-light testers, work formerly done by junior engineers.

The testing of cables done by women in an aircraft plant is closely allied to production work, but requires considerable skill and technical knowledge. Women install the entire instrument board, put on control switches and do all wiring and tubing operations pertaining to the instrument board. Women radio technicians were employed in another plant, a few draftsmen in a third.

In a scientific-instruments plant a girl does experimental work in the laboratory testing. Another does spectroscopic testing to determine what metals are present in various solutions.

A paper plant employs 60 women laboratory workers. Of these, 2 test pulp in the mill before the paper-making process begins; 16 measure wood as it comes into the woodyard. Tests of various sorts are made in the laboratory; for example, to determine the acidity or alkalinity of solutions. Some 15 or 20 more women might be used. In the tall oil plant were 2 women chemists. Tall oil is a byproduct of paper making and an essential war product.

In each of two milling companies women were doing routine laboratory testing. In one the work was described as testing for protein content, moisture ash, and vitamin B_1. With the program for enrichment of flour, much additional testing no doubt must be done. The work of women dietitians in determining vitamin content of foods, ways of preserving these food values in cooking or preserving, and so on, is well known.

Before women were hired this spring for surface work in a molybdenum mine, a woman with training in mining engineering was employed to survey the possibilities of using women. She is now supervisor of these women.

Only a few of the many new professional and semiprofessional jobs women are entering in the Federal Government may be mentioned. In the summer of 1942, 2 women engineers and 2 draftsmen were working for Civil Aeronautics Administration. The demand for civilian junior engineers is so great that women with college degrees in any field may qualify by taking a short tuition-free course.

Civil Aeronautics in December 1942 had 700 women communications and traffic-control operators. The Weather Bureau has appointed more

than 300 women weather observers. The Bureau of Standards has a special school to train women in metallurgy; women inspect quartz crystals from Brazil, work that has been done by men with at least 2 years of college physics. The Patent Office employs 4 women as examiners, a job requiring engineering training. About 400 women were working this spring in the chart division of the Coast and Geodetic Survey, where more than a million maps a month are turned out for the Army and Navy. There are only two steps in the process where there are no women.

A study has been made recently by the American Paper and Pulp Association on the employment of women in that industry. It covers about 100 firms employing more than 70,000 workers. In the technical department in March 1943 these plants reported 41 women chemists, compared with 5 in March 1941; 500 testers of pulp and paper compared with 13; and 62 research helpers compared with 8. There were 1 research engineer, 2 draftsmen, and 47 inspectors, positions no women held in 1941. Numbers of women to be added as necessary were 33 chemists, 201 testers, 29 inspectors, 3 draftsmen, and 27 research helpers. A press story of an individual plant making paper-board containers tells of women replacing men in the laboratory. Some of the routine tests made to determine the strength of the containers are: Mullen test to check the point at which paper or paper-board will burst; Scoll tensile-machine test to determine the "pull" strength of paper; compression tests carried out on both full and empty containers to determine how much bumping they will stand in handling, how high filled containers may be piled, and so on.

Two interesting examples may be cited of the way in which exposure to a technical problem may arouse a woman's interest.

(1) In the Technical Standards Division of Rural Electrification a young woman hated figures because they meant hours of typing. One day, out of curiosity, she asked her supervisor how to use a slide rule. Today, under his direction, she is working out her first sectionalizing study. These studies are highly complicated plans for shutting off certain sections of a power line whenever trouble in that section threatens to disrupt service. Fuses of different sizes and circuit breakers must be so placed and so coordinated that the faulty portion of the line will be cut off first, while the rest of the circuit continues to function. Making such a study involves more than use of advanced algebra and engineering formulas. It requires judgment to decide how best to protect important loads and where to place circuit-breaking apparatus for easy access.

(2) There is only one woman in the United States who computes isocandle and isolux curves for the use of electrical engineers. She began work for the General Electric Illuminating Laboratory nearly 3 years ago. Though she is not a high-school graduate she has worked herself into this unusual job. On the testing range, all in one day, a billion-candlepower searchlight may be analyzed, then the light from a cigarette measured. With a knack for mathematics this girl proceeded to find out how and why. Now she knows how to make some 800 photometer readings. From these she computes with slide rule and calculator the curves showing the light distribution obtained by testing a unit. *(Continued on p. 7.)*

65,000 Workers Sustain Disabling Injuries

Approximately 65,000 workers in the manufacturing industries of the United States experienced disabling injuries at work during May, according to a report summarizing estimates based upon the Bureau of Labor Statistics monthly industrial injury survey.

Using the conservative average of 20 days lost time for each disabling injury, these injuries represent the direct loss of 1,300,000 man-days of productive effort, a loss equivalent to the withdrawal of 50,000 workers from their manufacturing activities for the entire month.

At the end of the reporting period, 0.4 percent of the reported injuries were known to have resulted in death, and 3.2 percent had definitely developed into permanent physical impairments. Later information probably will show that other injuries, which appeared only temporary at the end of May, developed into additional deaths and permanent impairments.

Cumulative injury frequency rates for the first 5 months of 1943 ranged from an average of 4.7 disabling injuries for every million employee-hours worked in the women's clothing industry to 66.4 in the planing mill industry. Five other industries had cumulative frequency rates which ranged above 40. At the other end of the scale the best safety records for the 5-month period were those of the following industries: Women's Clothing, 4.7; Sighting and Fire Control Equipment, 7.1; Rayon and Allied Products (Chemical), 7.4; Radios and Phonographs, 7.8; Soap and Glycerine, 8.4; Men's Clothing, 8.7; Cement, 9.1; and Iron and Steel, 9.9.

Employment and Weekly Pay Rolls

A total of 38,370,000 people were employed in nonagricultural establishments in July 1943, on the basis of reports made to the Bureau of Labor Statistics. This level of employment indicates a net addition over the year of 1,136,000 employees, or an increase of 3 percent, which is due primarily to the continued expansion of the manufacturing industries. Total nonagricultural employment in July was slightly below that in June. The small decline (0.3 percent) can be attributed to continuing wartime restrictions on the construction industry and a seasonal drop in retail trade, which together offset the increase in manufacturing.

MANUFACTURING

From June to July, the number of wage earners in manufacturing industries increased by 61,000 to a total of 13,882,000. The transportation equipment and automobile groups continued their expansion by adding 24,000 wage earners during the month. The food group experienced a seasonal increase of 62,000, principally in the canning industries; the usual summer recession in the textile and apparel industries accounted for a decline of about 30,000. Since July 1942, wage earners in all manufacturing industries increased 10 percent; the durable-goods industries increased 18 percent, and nondurable goods industries 1 percent.

Weekly earnings in all manufacturing industries averaged $43.35 in June 1943 as compared with $43.22 in May. Weekly earnings in the durable-goods group, averaging $49.37, were 17 percent above June of last year while the earnings in the nondurable group, averaging $34.41, were 21 percent higher than a year ago.

NONMANUFACTURING

Employment in bituminous coal mining continued to decline, reaching a level more than one percent below June 1943 and almost 15 percent below July 1942. With the exception of iron, each of the metal mining industries had lower employment in July 1943 than in either June 1943 or July 1942. The metalliferous mining group as a whole employed 96,000 wage earners in July as compared with 109,000 a year ago.

Estimated number of wage earners and average weekly earnings in manufacturing industries by major industry groups (adjusted to Bureau of Employment Security final data for 1941 and preliminary data for the second quarter of 1942)

Industry group	Estimated number of wage earners (thousands)			Average weekly earnings		
	July 1943	June 1943	July 1942	June 1943	May 1943	June 1942
All Manufacturing	*Preliminary* **13, 882**	**13, 821**	**12, 564**	**$43. 35**	**$43. 22**	**$36. 25**
Durable goods	*8, 281*	*8, 250*	*7, 003*	*49. 37*	*49. 35*	*42. 26*
Iron and steel and their products	1, 713	1, 718	1, 612	48. 08	47. 65	40. 42
Electrical machinery	708	702	542	45. 73	45. 60	41. 81
Machinery, except electrical	1, 252	1, 251	1, 094	52. 48	52. 54	47. 71
Transportation equipment, except automobiles	2, 302	2, 288	1, 559	56. 00	56. 29	50. 80
Automobiles	686	676	513	57. 10	57. 00	51. 55
Nonferrous metals and their products	415	415	381	47. 47	47. 76	40. 32
Lumber and timber basic products	485	482	559	32. 81	32. 24	27. 00
Furniture and finished lumber products	361	358	374	33. 00	32. 74	27. 10
Stone, clay, and glass products	359	360	369	36. 46	36. 25	30. 96
Nondurable goods	*5, 601*	*5, 571*	*5, 561*	*34. 41*	*34. 11*	*28. 65*
Textile mill products and other fiber manufactures	1, 220	1, 233	1, 293	27. 66	27. 79	23. 84
Apparel and other finished textile products	832	850	866	26. 63	26. 61	21. 56
Leather and leather products	328	333	374	29. 93	30. 03	25. 83
Food and kindred products	1, 015	953	1, 052	36. 05	35. 63	30. 17
Tobacco manufactures	89	89	94	26. 45	25. 29	22. 37
Paper and allied products	317	317	302	36. 47	36. 21	30. 13
Printing, publishing and allied products	334	334	325	40. 42	39. 86	36. 21
Chemicals and allied products	739	741	613	42. 04	41. 50	36. 72
Products of petroleum and coal	126	125	129	51. 48	49. 93	40. 05
Rubber products	193	189	153	47. 10	45. 63	38. 22
Miscellaneous industries	408	407	360	40. 83	40. 83	33. 63

Estimated number of wage earners and average weekly earnings in selected nonmanufacturing industries

Industry	Estimated number of wage earners (thousands)			Average weekly earnings		
	July 1943	June 1943	July 1942	June 1943	May 1943	June 1942
	Preliminary					
Anthracite mining	(1)	71. 6	77. 0	$30. 32	$37. 39	$40. 25
Bituminous-coal mining	374	379	439	31. 81	39. 51	39. 91
Metalliferous mining	96. 0	97. 6	109. 0	44. 39	43. 43	39. 12
Iron	34. 1	33. 9	32. 6	42. 14	40. 92	38. 37
Copper	30. 1	30. 9	31. 4	47. 78	47. 03	40. 40
Lead and zinc	18. 4	18. 8	19. 6	43. 26	42. 62	39. 10
Gold and silver	6. 6	7. 2	18. 3	41. 48	41. 51	36. 84
Miscellaneous	6. 8	6. 8	7. 0	45. 66	46. 21	38. 14
Hotels (including salaried employees)	346	344	331	20. 00	19. 75	17. 43
Power laundries	267	270	281	23. 64	23. 87	20. 86
Dyeing and cleaning	84. 8	86. 8	85. 0	29. 15	28. 93	25. 33

[1] Not available.

Factory Working Hours Show Big Increase

Due to expansion in employment, total hours worked per week in June in all manufacturing were more than 5 million greater than in May. The increase in employment was more than sufficient to offset a decline of one-tenth of an hour in the work-week, due in part to vacations, which brought the available hours per week to 45.2.

Each of four durable groups which had a shorter work-week in June than May reported longer total hours. The increases in total hours for these groups that had lower average hours in June than May were as follows: transportation, 1,364,000; machinery, 183,000; nonferrous, 176,000; and electrical machinery, 118,000.

In the nondurable groups, however, the opposite situation prevailed. The three groups which had a shorter work-week in June than in May, also had drops in employment. The combined effect was a reduction in total hours of 1 percent for the textile mill products group, 2 percent for leather, and a little more than 2 percent for apparel. June is always a slack month for the industries comprising these groups.

The effect of the general coal strike is reflected in the 22.2 percent drop in average hours per week in the anthracite industry and in the 20.4 percent drop in the bituminous coal mining industry between May and June. The work-week in each of the mining industries averaged only slightly more than 28 hours.

Women's Employment in Professional or Technical Jobs

(Continued from p. 5.)

Today, according to Dr. Helen I. Miner, reporting to the American Chemical Society, the scope of opportunities for women in industrial chemistry is almost unlimited. The Cellophane Research Laboratories of the Du Pont's Rayon Department in Buffalo employs 12 women in a group of 60. Of the 12, 4 are doing research work, the others are technicians assisting research chemists. At the Hercules Experiment Station in Wilmington, 13 women held technical posts in December 1941. A year later the number had increased to 48 chemical engineers, chemists, and technicians—1 woman for every 5 men on the technical staff. At the research laboratory of the Victor Chemical Works at Chicago, women comprise one-fourth of the staff, their work ranging from routine bottle washing to advanced research. Many of the company's facilities are devoted to production of chemicals for war uses. Food chemicals for civilians and the armed services and industrial chemicals essential to the making of munitions are included. Research is being done on fireproofing compounds and waterproofing compounds. The new synthetic-rubber plant in West Virginia employs a woman graduate chemist and 5 college graduates with some technical training who function as technical clerks. There are 20 junior analysts and 8 who make physical tests of rubber. These girls are high-school graduates, and have had a special 4-month course under graduate supervision. At full capacity it is expected that 50 girl analysts will be employed.

Cost of Living in July, 1943

With meat prices cut back by the OPA and vegetables seasonally lower, the cost of living for city workers dropped 0.8 percent from mid-June to mid-July—its first substantial decline since Pearl Harbor. Retail food prices as a group—representing about two-fifths of total living costs—declined by 2.0 percent. Clothing costs rose 0.5 percent. Other costs, including house furnishings, utility rates and services, were stable or increased moderately.

Until this summer, the rise in living costs had been almost uninterrupted since Germany invaded Poland. The only previous monthly declines were during the 3-month period immediately after the outbreak of war, following a speculative rise in food costs, and a small decline of 0.2 percent from May to June of this year. The Bureau of Labor Statistics' index of the cost of living on July 15 was at 123.8 percent of its 1935-39 average, about 5 percent above September 1942 and 23 percent above January 1941, base date of the Little Steel formula.

The substantial declines for most meats in July resulted from reductions in maximum prices ordered by the OPA. They included an 8½ percent drop for beef and veal, 8 percent for pork, and 4 percent for lamb. Prices of chickens, which were not affected by the OPA cutback, were down fractionally—0.5 percent. There were continued reports of acute shortages of beef and poultry in many areas. Fresh fish prices rose 4 percent from mid-June to mid-July, but were subject to an OPA regulation on July 22, establishing maximum retail prices below the July 15 level. On the average, prices of meat, including fish, were down 5.5 percent.

Victory garden produce and larger commercial supplies helped to accelerate the normal summer decline in vegetable prices which in almost all cases was greater than usual from June to July. Cabbage was down 35 percent, beets 27 percent, white potatoes 15 percent, lettuce 11 percent, sweetpotatoes 5 percent and onions 2 percent. Prices of spinach, on the other hand, rose 42 percent, with supplies extremely scarce in some cities. Despite the many summer reductions, fresh vegetable prices as a group were still about 40 percent above a year ago.

Aside from spinach and fresh fish, the only important price increases among foods were seasonal advances of 5 percent for eggs, a greater than seasonal increase of 10 percent for oranges, and smaller advances for dried fruits and some cereals.

Clothing prices in July were on the average about 0.5 percent above June, mainly because of a fairly widespread substitution of higher priced lines of women's percale house dresses, men's business shirts, and chambray work shirts.

Miscellaneous goods and services rose 0.2 percent, with medical expenses and beauty and barber shop and laundry services somewhat higher than in June. The higher costs for laundry services were the result of local adjustments in maximum charges by the OPA, in most cases because of higher labor costs.

Cost of living in 21 large cities

Area and city	Index as of July 15, 1943 1935-39=100	Percent of change from—		
		June 15, 1943 to July 15, 1943	July 15, 1942, to July 15, 1943	Aug. 15, 1939, to July 15, 1943
Average: Large cities	**123.8**	**−0.8**	**+5.8**	**+25.6**
North Atlantic:				
Boston	120.2	−1.3	+3.8	+23.8
Buffalo	126.1	−1.3	+4.3	+28.0
New York	123.8	0	+7.5	+25.1
Philadelphia	122.6	−1.0	+5.4	+25.4
Pittsburgh	123.6	−1.0	+6.0	+25.6
South Atlantic:				
Baltimore	125.9	−1.7	+6.2	+27.6
Savannah	132.2	−.1	+8.7	+33.1
Washington, D. C.	123.0	−.6	+5.7	+24.7
North Central:				
Chicago	122.9	−1.0	+5.6	+24.5
Cincinnati	123.6	−.6	+5.9	+27.0
Cleveland	127.7	−1.2	+7.1	+27.7
Detroit	126.0	−.6	+6.3	+27.9
Kansas City	120.7	−.9	+6.1	+22.4
Minneapolis	121.0	−.7	+4.2	+21.4
St. Louis	123.1	−.5	+5.8	+25.5
South Central:				
Birmingham	126.1	−.2	+7.6	+28.0
Houston	122.5	−.6	+5.0	+21.6
Western:				
Denver	122.6	−.7	+5.7	+24.3
Los Angeles	125.0	−1.0	+4.2	+24.4
San Francisco	127.4	−1.0	+7.7	+28.3
Seattle	126.2	−1.5	+5.4	+25.8

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U. S. GOVERNMENT PRINTING OFFICE: 1943

ADVANCE RELEASE

ADVANCE RELEASE: For SUNDAY Papers, May 23, 1943
ORR--WMC--2037

OFFICE OF WAR INFORMATION
WAR MANPOWER COMMISSION PM-4383

Experienced professional and technical men and women in critical fields are assured of all-round placement services when they register with local United States Employment Service offices, Paul V. McNutt, Chairman, War Manpower Commission, said today.

A careful cooperative procedure between the National Roster of Scientific and Specialized Personnel, of the WMC Bureau of Placement, and all local offices of the Employment Service, has been placed in operation, Mr. McNutt said.

The names of registrants, together with information regarding each applicant's availability, are now immediately sent to the National Roster in the event they cannot be placed immediately by the local employment office. Further correspondence may be conducted from the Washington headquarters of the Roster. In this way, it is believed, the qualifications of additional thousands of persons with specifically needed abilities will be entered on the Roster's punchcard system, and important war jobs may be more easily filled.

Orders from employers for scientific and specialized personnel which cannot be filled locally by a local USES office, are forwarded to the headquarters of the National Roster at the time a State Administrative Office of the Bureau of Placement grants State-wide clearance of the local office order.

If the Roster has on its lists names of men and women who meet the qualifications demanded by the local office order, the registration papers are immediately sent to the local offices which received the order. The registrants' availability for new assignments will be noted on these papers whenever possible. Since these registration papers are confidential, employers will be asked not to make notes on the information which may come to their attention as the papers are examined.

The United States Employment Service will handle any necessary negotiations with any employer for releasing a scientifically or technically trained man or woman from present employment to fill a job more important from the standpoint of winning the war.

The National Roster, is now conducting an intensive recheck of some of its registrants in the more critical fields to determine their availability for jobs other than those they now hold, and the conditions under which other employment would be acceptable. The local offices of the United States Employment Service will assist the Roster in contacting individuals personally on these points whenever necessary, Mr. McNutt added. Local Employment offices will also contact Roster registrants in their areas in connection with specific openings which the Roster is trying to fill.

X-15190

A follow-up system has been instituted by the Roster, so that as names of qualified candidates are submitted to an employer, the Roster is notified of placement results. The new arrangements with local employment offices and State Administrative Offices of the Bureau of Placement will aid in keeping this information up-to-date and complete, Mr. McNutt said.

Orders for scientific and specialized personnel sometimes border on the unique. For example, an order for a production manager in a St. Louis small arms and ammunition plant--salary $8,000 to $9,000--specified that the man be 40-55 years of age, an engineering graduate or possessing equivalent engineering experience, with high intelligence rating, character, judgement..."must have background of toolroom and machine shop supervision, and know current practice in tool, die, and gage production...must be used to supervision of large numbers of both male and female employees and be good disciplinarian..should have recent experience in an industry where production demands close tolerances and excellent finish on highly repetitive operations..applicants who are within draft age and have no dependents or justification for deferment should not be referred..4F status not acceptable..."

In this instance the Roster was able to give the names and addresses of eight men meeting the specifications, one of whom was selected for the job.

In another instance a geologist was needed to head a geological field survey in Eastern Venezuela. The specifications submitted by the employer read as follows:

"Man must have knowledge of regional geology of the Llanos area of Eastern Venezuela; must be familiar with special physical problems of tropical operations; must have working knowledge of the Spanish language. Physical conditions require an extremely able-bodied, rugged individual, of even disposition, calm temperament, with the faculty of remaining for long periods in primitive areas where recreational and social facilities do not exist. The salary is $325 a month plus maintenance. The term is for two years."

From 12 resumes submitted by the National Roster to the company seeking a geologist for work in Venezuela, two candidates were selected for personel interviews. It is expected that one of the two will be selected for the job. Both Roster registrants, incidentally, happen to be residents of San Antonio, Texas.

An important aircraft corporation in Connecticut had almost despaired of finding an expert to head up a department which would develop, operate, and maintain electronic equipment for measuring dynamic strains and deflections of airplanes during tests and actual flying. Finally an appeal to the Roster was made. Result: five qualified men were brought to the attention of the Corporation. If it is deemed in the national interest for these men to leave the jobs where they are now employed to undertake the new assignments, it is probable that the corporation will hire all five.

The occupational fields in which local employment offices will cooperate with the Roster on registration and placement are as follows:

Accountants and Auditors
Architects
Historian
Historical-Research Assistant
Chemists, Assayers, and Metallurgists
Engineers, Chemical
Engineers, Electrical
Engineers, Civil
Engineers, Industrial
Engineers, Mechanical
Engineers, Mining
Statisticians
Forest Supervisors
Economist
Economic-Research Assistant
Psychologist
Sociologist
Biologist
Bacteriologist
Geologist
Paleontologist
Astronomer
Physicist (include Geophysicist)
Meteorologist
Oceanographer
Acoustician
Seismologist
Horticulturist
Zoologist
Manager, Employment
Manager, Personnel
Managers, Industrial Organization
Managers, Production

Roster registrations to date have reached the total of 400,000, exclusive of physicians, dentists, and veterinarians. Registrations still to be obtained probably number over a half-million, Mr. McNutt estimated.

Magazine Bureau
Office of War Information
Social Security Building
Washington, D. C.

August, 1943

PUTTING THAT COLLEGE EDUCATION TO WORK

The situation of the college woman today might be summed up in these words: unprecedented opportunity, unprecedented obligation.

From all sides comes the clamor for her services. She is asked to join the WACS, WAVES, SPARS and WOMAN MARINES. The war industries issue recruiting pamphlets to tempt her to come into their plants. It takes a 77-page booklet (Civilian War Service Opportunities for College and University Students) for the U. S. Civil Service and the American Council on Education to list her opportunities in the federal civil service. Fourteen vocational fields are included in this text: accounting, administration, agriculture, economics and statistics, engineering, home economics, industrial arts, industrial management, law, library work, medicine and related fields, physical sciences and social work. The Smith College Vocational Office has issued a pamphlet, College Women in War Work, listing employers seeking the services of the graduating class. Positions available to inexperienced candidates were listed in more than 30 occupations.

It is the duty of the woman graduate to take a job in which she can help to win this war. She can do no less for the country which made her college degree possible. Had she lived in an Axis country, she would have had no hope either for education or career. If she can find work in line with her college major, fine! If not, the patriotic course is to take a place in the ranks--even as her drafted brother has done.

The modern girl reads magazines expecting to be guided in the solution of her problems. Editors who understand supply and demand in the specialized labor market for the college career girl may be of great help both to their readers and to the war program.

Job Supply and Demand: The War Manpower Commission estimates that 3½ million people must be added to the labor force this year. Of this number, approximately 2 million will be women. It is obvious, then, there is work waiting for all of the approximately 76,000 women who will complete regulation college courses or post graduate courses in 1943. They are a reservoir of "bright young things" who have had unusual advantages. Manufacturers look to them for technical help in getting out their war contracts. Educators ask them to help keep the schools running. Librarians want their assistance in serving an information-hungry public. Instead of having to work and scrimp and save for a little added technical education, the college girl of today may find free training at many colleges and universities in specialized war-connected fields under the Engineering, Science, Management War Training Program of the U. S. Office of Education. In courses varying from six weeks to six months, she may sharpen her special skills. In addition, some industries have set up

their own systems of training, sometimes in cooperation with accredited colleges and universities. In these courses conducted by industry, some companies in specialized industries where the labor supply is very short may even pay trainees during the learning period.

The home woman with a college education, unless she has young children, has her opportunity and her obligation too. She has enjoyed advantages denied to millions of other women the world over. Her training is wanted by her country now. She may reenter her old field, or may take an ESMWT course which will fit her into war industry on the basis of skills acquired in college. She may take a war job in necessary civilian services.

Even the girl in college may by part-time work combine a worth while war contribution with getting an education. Thousands of college girls are doing just that, and gaining both by acquiring practical experience and by earning part of their way through school.

Job Placement: In addition to the familiar placement channels of peacetimes--the United States Employment Service, the college vocational offices, teachers agencies public and private, and professional associations--the war has brought an over-all avenue of opportunity to the professionally and technically trained, the National Roster of Scientific and Specialized Personnel of the War Manpower Commission, located in Washington, D. C.

The Roster: Beginning operations in July, 1940, the National Roster of Scientific and Specialized Personnel, usually referred to informally as The Roster, has piled up approximately 650,000 registrations in 62 professional fields. Best guess as to the number of women is about 18,000 mostly in the fields of economics, sociology, psychology, personnel, mathematics, chemistry, history.

It is estimated that 50,000 specially trained people have been placed in war industries, both in and out of government, or have been put in professional and scientific posts in the armed services, by the Roster. No separate tally has ever been made of women placements, but as many as 150 have obtained positions in the field of mathematics, and as high as 700 to 800 in the field of chemistry.

The invitation for technically-trained women to register with the Roster is wide open. In five critical fields, the Roster requests registration even before college is completed. Students within one year of receipt of a bachelor's degree, and who are majoring in (1) Agricultural and Biological Sciences, (2) Engineering and Related Fields, (3) Physical Sciences, (4) Social Sciences, (5) Administration and Management are asked to fill out a Student Questionnaire. These forms are sent to the colleges and universities, and the cooperation of the faculty is enlisted in getting their promising students to enroll for important war work upon graduation.

For the more highly trained professional, the woman with a master's or doctor's degree, registration with the Roster is through filling out a technical check list in the field in which she has had training and experience. The call to current graduate students is in the following seven groups of fields: (1) Agricultural and Biological Sciences; (2) Engineering and Related Fields; (3) Humanities--only foreign languages majors with Ph. D's are requested to register; (4) Medical Sciences and Related Fields; (5) Physical Sciences; (6) Social Sciences; (7) Administration and Management. Colleges often assist in registering their graduate students with the Roster. Individuals may write the Roster directly and ask for the appropriate check list.

The Roster requires no aptitude tests. It is taken for granted that by the time a girl gets a bachelor's degree in science from an accredited college, she has survived such screening as might have been necessary. A girl with a bachelor's degree in economics is not expected to be an experienced economist--she is placed in a professional grade suited to her training. It is confidently said at the Roster that any woman graduating from college trained in the physical and engineering sciences can be almost immediately placed in war industry. Discrimination has not disappeared, but in many industries and firms, it is disappearing.

The modern business machines, such as are used for census and social security records, greatly facilitate the work of the Roster. The qualifications of each registrant are put on an index card and coded. As job orders come in, the cards are run through the machines to sort out the registrants with the appropriate qualifications. The Roster does not make placements. It simply puts employers in touch with qualified scientific and professional people. Sometimes this means a job close at home. Or it may mean work in a different part of the country. In professional work, there is more freedom of movement around the country than in jobs where great numbers of people are needed.

A few examples: A war research project, highly important, in the vicinity of Washington requires four women with bachelor degrees in chemistry. They are being brought here from different parts of the country. A parachute company in Utah, unable to recruit a new industrial engineer, employed as a trainee a woman who had taken an engineering course while training to be an architect. A woman with a Ph. D. in physics, whose husband is in an Army camp near Washington, registered with the Roster as being willing to take work in her field within travelling distance of the camp. She got it, and was thus able to be near her husband.

A cooperative procedure has now been set up whereby names of technically trained persons who register with USES are immediately sent on to the National Roster if they cannot be placed immediately by the local employment office.

Roster Analysis of 1943 College Graduates: The National Roster recently made a survey of 1943 college graduates, listing by major subjects of study all women who will graduate from college and post-graduate courses before September 30, 1943. This material has been useful in evaluating

this source of labor supply.

Questionnaires were sent to all universities, colleges, professional and technical schools, teachers colleges, normal schools and junior colleges listed in the 1941-42 directory of the U. S. Office of Education. The following figures show the fields in which the approximately 76,000 women leaving college this year were trained, roughly classified as to their chance of getting jobs.

GROUP 1:

SUBJECT	GRADUATE STUDENTS	SENIORS
Accounting and auditing	26	327
Agriculture	27	159
Business	486	5,427
Chemistry	221	1,149
Dentistry	67	121
Economics	263	1,376
Education	2,593	13,489
Engineering	17	105
Geology	28	107
Home Economics	461	6,872
Mathematics	137	1,083
Medicine	80	235
Meteorology	6	9
Natural Science	377	497
Nursing	142	3,036
Nutrition	83	857
Pharmacy	5	189
Physical Education	181	1,559
Physics	49	119
Psychology	334	1,541
Public Administration	140	115
Public Health and Hygiene	67	477
Social Work	1,459	1,208
Veterinary Medicine	6	10
Totals:	8,255	40,067
Grand Total:	48,322	

GROUP 2:

SUBJECT	GRADUATE STUDENTS	SENIORS
Architecture	5	111
Fine Arts and Languages	2,066	15,047
Geography	32	161
History	417	2,686
Law	36	217
Totals:	2,556	18,222
Grand Total:	20,778	

Total: Group 1	48,322
Group 2	20,778
GRAND TOTAL	69,100
Estimated 10 percent increment expected from non-reporting schools	6,910
Estimated over-all total numbers of senior and graduate women students potentially available for employment by September 30, 1943	76,010

Most of the girls in Group 1 should be immediately able to secure employment in their respective fields. A few of those in Group 2 will go into their own fields.

For those not immediately placed, two courses are open: (1) Take specialized training in ESMWT courses which will fit them into jobs in fields of critical need; (2) take one of the hundreds of jobs in necessary civilian services for which added training is not necessary.

ESMWT: The ESMWT courses offered by the Office of Education are designed to meet specific requirements of local situations after consultation with representatives of war industries. Trainees are "screened" on the basis of background and adaptation to possible future employment. Sometimes tests--psychological, aptitude, or general intelligence--are given. Fredquently plants place an order for a definite number of trainees before enrollments are opened. Facilities of the United States Employment Service and of the United States Civil Service Commission are available for placing those who have completed courses. While there is no guarantee of employment, the demand, particularly for women, is so heavy and so specific that little difficulty is experienced in placing those who have completed a course.

Typical Courses for Important War Industries: Because ESMWT courses are set up in accordance with the needs of local industries for college-trained people, courses available to a college graduate will naturally have a direct kinship to the industries of her community. For instance, in a city which has an aircraft plant, there are likely to be courses in aircraft stress analysis and aircraft design. Near steel works, metallurgical courses will assume importance. Typical of courses which serve various industries are those listed below:

Courses Serving Shipbuilding Industries

1. Engineering Aid (Radio)
2. Inspection of Naval Materials (communication equipment)
3. Principles of Radio
4. Pre-Electronic Instructor Training for Women
5. Ship Machinery for Women
6. Ship Piping Layout for Women
7. Hull Ship Construction for Women

Courses Serving Aircraft Industries

1. Aircraft Materials Inspection for Women
2. Airplane Drafting for Women
3. Elements of Machine Design for Women
4. Elements of Engineering for Women

Courses Serving Ordnance Manufacturing Industries

1. Ordnance Inspection for Women
2. Ordnance Engineering Aids
3. Ballistics Engineering
4. Ordnance Safety
5. Elements of Ordnance Machine Design

Courses Serving Explosives Manufacturing Industries

1. Chemistry of Smokeless Powder
2. Chemical Properties of Explosives
3. Fundamentals of Explosives Manufacture

Courses Serving Chemical Industries

1. Chemical Testing & Inspection
2. Quantitative Chemical Techniques for Women
3. Practical Chemical Analysis for Women
4. Introductory Organic Chemistry
5. Food Dehydration Techniques

Courses Serving Mining & Metallurgical Industries (Steel, Aluminum, etc.)

1. Elementary Metallurgy
2. Physical Metallurgy
3. Chemistry of Metals
4. Metallurgical Techniques for Women
5. Metallographic Laboratory Practice for Women

Courses Serving the Rubber Industry

1. Elements of Synthetic Rubber Manufacture
2. Synthetic Rubber for Petroleum
3. Petroleum Chemistry Including Butadiene
4. Modern Rubber Technology & Practice

Courses Serving the Petroleum Industry

1. Petroleum Refinery Engineering
2. Testing of Petroleum Products
3. Chemical Technology for Petroleum
4. Petroleum Engineering

Courses Serving the Army Mapping Program (Civil Service)

1. Military Map Making
2. Use of Surveying Instruments and Surveying Field Procedure
3. Photogrammetry and Interpretation of Aerial Photographs

Courses Serving Activities That Occur Widely Throughout Many Industries

1. Accounting
2. Elements of Engineering
3. Elements of Machine Design
4. Industrial Drafting
5. Inspection Practices
6. Office Supervision
7. Personnel Administration
8. Safety Engineering

ESMWT courses are offered in 222 colleges and universities. Classes easily can accommodate 175,000 persons at any given time. As of April 30, 1943, there were 145,000 trainees of whom 32,000 were women. Courses last from 8 to 27 weeks. Within the next year, a need for from 500,000 to 600,000 trained women is anticipated. Facilities for training that many women will be available.

Industries Training on the College Campus: For the girl with from one to three years of college work to her credit, a number of industries now offer college campus opportunities to train for specific war work in their plants. Students receive some pay while in training, usually about $10 a week. A few of the many such special opportunities opened to women as the result of the war are given here:

Outstanding women who have completed their junior year in college may receive eight months intensive training in aeronautical engineering at New York University under formal contract with the Chance Vought Aircraft Company which includes an option on the student's services for one year after completion of the training course. These students do not necessarily lose their college degrees, as arrangements may be made to transfer their New York University credits to their original colleges.

Curtiss-Wright Corporation, one of the few aircraft companies which manufactures all parts of a plane, the engine, the propeller, and the aircraft itself, has created a ten months' course for Engineering Cadettes--college girls who have completed the sophmore year. A hundred such Cadettes will be trained in each of eight universities--Cornell University, Iowa State College, University of Minnesota, Northwestern University, Purdue University, University of Texas, Pennsylvania State College, and Rensselaer Polytechnic Institute.

One year of college work is the pre-requisite of the RCA Engineering Cadettes, training on the campus of Purdue University, Lafayette, Indiana. Their course, which runs 44 weeks, includes radio laboratory, industrial orientation, production processes, mathematical problems, electronics, elementary electricity, and electrical drafting. The booklet sent out to help recruit them gives tantalizing glimpses of the world after the war in which they may be playing a creative role. Theatre television is awaiting the end of the war for further development.

Thermal radio--heat produced by radio waves--has been developing and will undoubtedly be an important post-war product.

The Grumman Aircraft Company, at Bethpage, Long Island, has an intensive training course for college women selected on the basis of tests and interviews. First comes a 9 weeks' training course at Columbia University. Next the students enter a 4 weeks' course at the Freeport State Aviation School, working on shop methods and mechanics. They finish with three months in the Grumman plant. Here she spends one week in each key department, and one month of specialization in the department of her choice.

On the West Coast, Boeing Aircraft Corporation and Consolidated Aircraft Corporation have made arrangements for three months courses in drafting and technical calculations for women in the schools of engineering at Oregon State College and Stanford University.

The U. S. Weather Bureau in cooperation with the Civil Aeronautics Administration has sponsored 9-month courses in meterology for women airplane pilots in Massachusetts Institute of Technology, University of Chicago, California Institute of Technology, University of California and New York University.

Various college training courses are offered by the War Department for civilian personnel in Ordnance, Signal Corps, Army Air Force, Army Mapping Service, etc. For information on these courses consult the nearest regional Civil Service office or the local USES office.

War Minors: On many campuses, women students who have not chosen as a major a field of learning directly connected with war work are being urged to prepare for active service by taking a so-called war minor. For instance, the Latin scholar or student of medieval literature may choose from war minors such as the following fields: mechanical drafting, statistics, engineering aides, day nursery supervision, public administration, and recreational leadership.

College Combined With Part-Time Jobs: In critical war areas, there is an increasing tendency to combine college courses and part-time war jobs. Hundreds of women students in New England colleges are registered with the USES to help out in industry as the need arises and they can manage part-time work in conjunction with their college schedule. Students at New Jersey State College for Women have been doing a war job at the near-by Johnson and Johnson plant. Shurtleff College, Alton, Illinois, and the Western Cartridge Company there have teamed up to enable young women to pay for their college education by working in the cartridge plant. The plan is for two girls to share a room in the college dormitory, one working at the plant while the other takes a quarter-term collegiate course. At the end of the three months, they trade jobs.

Necessary Civilian Services: The college woman who cannot at the moment find the job of her choice should for the duration take any one of the hundreds of jobs at hand. Schools, retail stores, communica-

tions, transportation, agriculture, welfare services must be kept running. The Magazine Bureau, OWI, prepared a set of 27 Fact Sheets on Women in Necessary Civilian Services, which already have been made available to magazines, and which were also made use of by the War Manpower Commission in the September, 1943 program to rally women for these civilian jobs.

May 1, 1943

Basic Data for OWI Campaign on

THE DEMAND AND SUPPLY OF COLLEGE WOMEN GRADUATES
May to October 1943

PURPOSE:

1. To call the attention of employers to the availability of 76,000 young women who will be graduating from the schools and colleges of the United States before September 30, 1943.

2. To inform these young women of the opportunities open to them to use their special abilities and training in the war program.

3. To publicize the activities and services of USES; the National Roster of Scientific and Specialized Personnel; U. S. Civil Service; ESMWT courses (Bureau of Training, WMC and U. S. Office of Education).

THE SITUATION:

According to current estimates of the National Roster, 76,000 seniors and advanced women students will be leaving the colleges and universities of the United States before September 30, 1943, and will be available for employment.

They represent a new and untapped source of supply--one that is mobile, intelligent, young, energetic, strong, and healthy.

What are they prepared to do in the war program?

How many of them can be absorbed into the labor market for trained personnel?

The following data have been prepared in cooperation with the National Roster, WMC.

Figures compiled by the NATIONAL ROSTER are based on returns to a questionnaire distributed by the National Roster of Scientific and Specialized Personnel. Schedules were sent to all universities, colleges, professional and technical schools, teachers' colleges, normal schools, and junior colleges listed in the 1941-42 Directory of the U. S. Office of Education, and to certain unlisted institutions which appear to fall in one of these categories. Approximately 1,850 schedules were distributed and on January 15, 1943, 1,423 usable returns had been received. This number includes replies from 692 colleges and universities, 137 professional and technical schools, 172 teachers's colleges, 35 normal schools, and 387 junior colleges. In addition to these, 90 schools returned unusable schedules. Since this tabulation was made, 143 replies have been received. These replies will be included in a subsequent report. Also a further analysis by States.

(Note) Data on nursing enrollments apparently include many student nurses not pursuing courses of collegiate grade.

(Note) Many institutions did not distinguish pre-professional students from other undergraduates. The distribution of pre-professional students by "expected dates of graduation" are of doubtful significance in view of the varying periods of training required for admission to professional schools, and in view of the fact that a large proportion of these students enter professional schools without first receiving academic degrees.

THE DEMAND FOR COLLEGE WOMEN

The demand for trained technical and professional workers cannot be stated numerically, for obvious reasons. There are, however, shortages which these women can fill:

SHORTAGES:

Engineers:	Estimated demand.....	40 - 50,000
	Men graduating in June.....	17,000
	Excess of demand over new supply....	23 - 33,000

123 women expected to graduate this year

Doctors, dentists, nurses, vetgrinarians:		unlimited numbers
Teachers:	Elementary and secondary schools	10,000
Social Workers:	In community services	12,000
Industry:	needs 5 to 10 times the available supply of engineers, physicists, and production supervisors.	

Medical and Health Fields 5,000 - 10,000 needed immediately
- Occupational Therapy
- Physical Therapy
- Medical & Psychiatric Social Workers
- Technical Personnel in Hospitals

THE JOB DEMAND FOR COLLEGE WOMEN

For the TECHNICALLY TRAINED the demand will be greater in the next few months than ever before in the history of the United States. Many colleges report an increase of 100% since the war started.

Group 1. The demand is greatest for those who have had training in specific fields, notably mathematics, the physical, engineering, and medical sciences.

Group 2. There is a great demand for those who have had training in the natural sciences--biology, botany, zoology--in economics, geography, history, home economics, and psychology, especially if the secondary field of study has been in the subjects in greatest demand or in the languages of the Orient, the Slavic, and Scandinavian countries.

Group 3. The demand is more limited for those whose training has no obvious relation to the immediate demands of the war program for technical personnel, such as art, music, drama, and literature.

On the elementary and secondary school level, the demand for teachers is urgent; also in science, mathematics, shopwork, agriculture, and home economics, on the college level.

To amplify the above statements, the following groupings are submitted as a rough estimate. The demand, of course, will vary from one locality to another, dependent upon the local industries, the locale of the armed forces and other factors. The presumption, however, is that these new college graduates are a "mobile" labor force, free from family ties and other economic and personal considerations, to work where they are most needed.

A. TECHNICAL FIELDS

Group 1
Accounting
Agriculture
Auditing
Chemistry
Dentistry
Drafting
Engineering
Mathematics
Medicine
Nursing
Office Work
Physics
Social Work
Teaching (Elementary & Secondary)
Veterinary Medicine

Group 2
Bacteriology
Dietetics
Economics (Statistics, Labor Analysis, etc.)
Geology
Immunology
Languages (Asiatic, African, Slavic, Scandinavian, Portuguese)
Library (Special, such as Medical, etc.)
Map Making (Cartography)
Medical Techniques
Meteorology
Nursery Schools
Nutrition
Occupational Therapy
Pathology
Pharmacy
Photography
Physical Education
Physical Therapy
Psychology (Social work, mental Hygiene, etc.)
Public Administration
Public Health
Recreation

Group 3
Architecture (except drafting)
Astronomy (Celestial Navigation)
Commercial Art
Journalism
Editorial
Public Relations
Geography) Except as secondary or in combination with other subjects, or teaching
History)
Languages)
Law
Public Administration
Radio Program Production
Motion Pictures (Photography and Production)

In all parts of the country there is a great need for workers in:

B. NON-TECHNICAL FIELDS

Communications: Telegraph and telephone; teletype; radio.
Transportation: Information; chauffeurs; mechanics; clerks and dispatchers; conductors; trainmen; traffic clerks.
Agriculture: Dairy; poultry; harvesting; food processing; packing.
Health and Welfare Programs for War Workers: Managers; clerks.
Child Care Centers: Laundresses; cooks; mothers' helpers.
Community and Personal Services for War Workers: Shopping; housecleaning; foster-care of young children, receptionist; clerk; inspector in housing and information centers for war workers.
Education: Clerical and janitorial workers.
Hospitals and Clinics: Receptionist; attendant; assistant in doctor's and dentist's office; clerical work.
Publications and Printing: Linotype operator; proof reader.
Retail Trade: Sales clerk; buyer; cashier; bookkeeper; stock-girl.
Restaurants, Cafeterias, Hotels, Boarding Houses: Housekeeper; supervisor; steward; food buyer; cook; waitress; switchboard operator; room clerk; manager; hostess; counter attendant.
Laundry and Dry Cleaning: Spotter; dyer; checker; sorter; marker; inspector; supervisor.
Service and Repair Trades:

PRELIMINARY REPORT ON REGISTRATION OF SENIOR AND GRADUATE WOMEN STUDENTS IN COLLEGES AND UNIVERSITIES POTENTIALLY AVAILABLE FOR EMPLOYMENT BY SEPTEMBER 30, 1943 -- Listing by major fields of study. These data represent returns from approximately 90 per cent of the colleges and universities.

GROUP 1:

SUBJECT:	GRADUATE STUDENTS		SENIORS
Accounting and auditing	26		327
Agriculture	27		159
Business	486		5,427
Chemistry	221		1,149
Dentistry	67		121
Education	2,593		13,489
Engineering	17		105
Mathematics	137		1,065
Medicine	80		235
Nursing	142		3,036
Nutrition	83		857
Physical Education	181		1,559
Physics	49		119
Social Work	1,459		1,208
Veterinary Medicine	6		10
Totals:	6,574		28,884
Grand Total:		35,458	

GROUP 2:

SUBJECT:	GRADUATE STUDENTS		SENIORS
Economics	263		1,376
Geology	28		107
Home Economics	461		6,872
Meteorology	6		9
Natural Science	377		497
Pharmacy	5		189
Psychology	334		1,541
Public Administration	140		115
Public Health and Hygiene	67		477
Totals:	1,681		11,183
Grand Total:		12,864	

GROUP 3:

SUBJECT:	GRADUATE STUDENTS		SENIORS
Architecture	5		111
Fine Arts and Languages	2,066		15,047
Geography	32		161
History	417		2,686
Law	36		217
Totals:	2,556		18,222
Grand Total:		20,778	

Total: Group 1 and 2	48,322
Group 3	20,778
GRAND TOTAL	69,100
Estimated 10 per cent increment expected from non-reporting schools	6,910
Estimated overall total numbers of senior and graduate women students potentially available for employment by September 30, 1943	76,010

Placement of Trained Personnel (College Women)

The United States Employment Service is cooperating with the National Roster in placing qualified women in technical positions, in both government and industry, particularly in the fields of the medical, physical and engineering sciences, economics, accounting and auditing. USES is also cooperating with the U. . Civil Service Commission in placing women in Government agencies, including civilian personnel in the War and Navy Departments.

February 3, 1943

Miss Harriette Burr
453 South Anacapa Street
Ventura, California

Miss Harriette Burr, Chairman
Mathematics Department
Ventura Junior High, 1393 East Meta St.,
Request material for article appearing in
California Journal of Secondary Education

Dear Miss Burr:

Your letter has been received and I am replying immediately to give you such information as we have. I am asking other agencies to send you the following:

1. Bureau of the Census - their release P-16, No. 2, issued Nov. 1942. This gives the numbers of women in each of the professions and occupations in 1940.

2. War Jobs for Women - A pamphlet issued by the Office of War Information in Nov. 1942.

The reply I am sending also includes the material in reply to your letters to several other members of the Women's Bureau staff.

In December 1942 the total employment of women was about 15 million and the estimated additional need through 1943 is now 2.7 million. There is no breakdown by sex available as to occupation groups needed, but it has been stated that about 2 out of 3 of the women needed will be in service and transportation jobs of various types to aid in maintaining civilian life with the loss of men to the armed forces.

As to supply of woman labor available, in December 1942, there were only 600,000 women unemployed (of those normally in the labor force). In April 1942, an estimate based on the number of women at home with no children under 16 and eliminating women unable to work showed that approximately 7½ million women would be available for jobs if proper incentives were offered. Of the women in this estimate 1½ million were single. Some of those married or widowed were over 45 years of age, a group which up to the present employers have been very reluctant to draw from.

Though exact answers do not exist to your questions in the form in which you ask them, I am attaching available data in regard to certain of the specific occupations. Miss Lathrop of the Office of Education has told me that she will send you such material as they have, including data relative to the girl of 14 - 18 years.

Hoping this information will be of assistance to you,

Very sincerely yours,

Mary Elizabeth Pidgeon,
Chief, Research Division

MEP:ml
Enclosures

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

INDICATIONS AS TO NEED FOR TRAINED WOMEN WORKERS

Nurses. There were 361,000 trained nurses and student nurses reported in the Census, 1940, 348,000 of them actually in employment.
The National Nursing Council for War Services reported last summer that at least 50,000 nurses would be needed in the armed services during 1942-43, and that to offset this for civilian care at least 75,000 student nurses must be enrolled for training. Later estimates indicate the need of some 36,000 nurses in 1943 in addition to the 25,000 in the Army Nurse Corps and the 322,000 required for civilian needs.

Engineers. Jobs calling for women in engineering are of two types:

a. The sub-professional workers to handle detail work under professional direction. These are the jobs for which great numbers of women are needed now. They require only short training periods. Their promise of going far in the future probably is not great, but the practical contact with industry and the skill attained may be a stepping stone to further work. In the Civil Service alone, which includes work in many of the ordnance plants in all parts of the country, the calls for engineering draftsman run into the thousands, to serve in aeronautical, ship, mechanical, ordnance, electrical, radio, topographic, statistical and other jobs. Women in considerable numbers are being appointed by the Government as engineering aides in photogrametric and topographic work; they must be high school graduates and have one year of engineering experience.

b. The fully trained professional engineer. The Census lists some 700 women as various types of engineers. The American Society of Civil Engineers has 4 associate and 10 junior women members, the American Institute of Mining and Metallurgy 11 women members. There undoubtedly will be opportunities for women in engineering, but they will be relatively few. The woman going into this profession will have to have the initiative and ingenuity to make a place for herself in some type of work suited for women. Among the kinds of work done by individual women in engineering are steel design in a shipbuilding plant, cost studies of equipment, designing for a bomber plant, designing cantonments, sanitary engineering, production research in an airplane plant, computing loads for an electric power system. One woman metallurgist is an engineering consultant in one of the country's largest arsenals.

Chemists. The Census lists 1,600 women chemists. The 665 women members of the American Chemical Society constitute 3.5 percent of its membership. Ninety percent of those women are chemists; 7 women are chemical engineers. A woman is doing chemical analysis at a large plant making airplane parts; another is an assistant biochemist in a research foundation. Women are

doing chemical and physiological work, routine in character but in clean surroundings, in biological laboratories such as those of certain major drug companies. In explosives plants, women, now probably in considerable numbers, are testing powder, and at least one large plant has several women research chemists. Others are doing chemical laboratory work in food plants, such as sugar and flour testing, of a routine character.

Doctors. The Census reports 7,700 women doctors. This is a profession requiring long training, but one that is very necessary for more women to enter. With the country becoming so depleted of medical services, there is much need of doctors to maintain civilian health. A release of the Office of War Information, January 10, 1943 stated that 15 States already are short of doctors. Those in the West were Arizona, Colorado, Idaho, and New Mexico. It will long be necessary for women in the medical, as in other professions, to do some pioneering in order to become established. However, there never have been enough good doctors to fully maintain the public health in all branches. There are opportunities for women doctors to be taken for hospital internships, but in the past only a few have received resident physician appointments in hospitals. Women doctors are not commissioned in the Army or Navy except in the WAAC and WAVE organizations.

Women with Mathematical Training. Practical and applied mathematics is today much needed in an increasing number of jobs. This is likely to continue after the war even though the particular jobs may differ. For example, the Government now has urgent need of women with two years of college math (at least through trigonometry) as technical and scientific aides in radio, explosives, chemistry, metallurgy.

Home Economists. War food economies, priorities, rationing, and price control are enlarging the need for those with home economics training. Expanded nutritional activities are needed in many communities, especially those congested by migration of workers to new or enlarged war plants. As a few of the most obvious examples: Additional school lunch programs are needed; more restaurants must be provided in communities where homemakers are engaged in war work, especially since household helpers are scarce; war plants are more and more establishing their own canteens.

National Roster. The National Roster of Scientific and Specialized Personnel contains the names of 20,880 women in a total of 550,000 persons in 60 specializations. Persons on this roster are not necessarily seeking jobs, but have indicated their specialties so that the Nation may know. The list includes, for example, such outstanding persons as Dr. Jas. B. Conant, President of Harvard and Dr. Karl T. Compton, President of the Massachusetts Institute of Technology. Of the women 7,611 are social welfare workers, 4,000 in the physical sciences, 1,642 in foreign languages, 1,241 in personnel administration, 872 in medical and related sciences, 871 in agricultural and biological sciences, and so forth.

MEP
Feb 3, 1943

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

Among the women listed on the Roster, those prepared in the following are the largest groups:

Social Sciences		11,774
Social Welfare	7,611	
Psychology	1,114	
History and Political Science	843	
Physical Sciences		4,869
Chemistry	2,431	
Mathematics	916	
Humanities		1,658
Foreign Languages and Psychology	1,642	
Administration and Management		1,498
Personnel	1,241	
Medical and Related Sciences		872
Bacteriologists, Immunologists, Pathologists	422	
Agricultural and Biological Sciences		821
Engineering and Related Sciences		391
Landscape Architects	114	

Miss Harriette Burr February 4, 1943

Clerical workers. The 1940 Census reported 2,375,503 women employed as clerical and kindred workers (stenographers, typists, bookkeepers, office machine operators, telephone operators, etc.) and 148,760 seeking work in this field. In some instances cuts in office, sales and advertising forces in civilian industries and services have adversely affected the white-collar group. In Washington, D. C. and in various other areas, however, there have been increased demands for office workers and even acute shortages. Banks and financial houses are reported in some cities employing women to a considerable extent, not only in clerical work, but in more responsible jobs.

Sincerely yours,

M.E.P.

See revised version
Turner's files
Feb 3 1943

Miss Harriette Burr
453 South Anacapa Street
Ventura, California

Dear Miss Burr,

I have your letter of January 30th with its accompanying questionnaire. I shall let Miss Pidgeon of our research division answer the questionnaire, so far as she has such statistics at hand. My answer will necessarily fall in the realm of "opinion" but it is based on general information we have either through letters coming to the Bureau or from newspaper clippings received from all over the country, as well as on personal information derived from conferences, persons visiting the Bureau, etc.

My first comment has to do with the superior student who is naturally interested in scientific fields (including engineering). She definitely should be encouraged to take the full academic training and graduate work leading to higher degrees. Only then can she expect to take her place in the specialized professional world - and in certain subjects she must be really superior to the average man in that field to compete for equal recognition. (This has always been true for women newly entering a profession, but it is also axiomatic that none but the truly gifted woman student would want to push on to professional heights.)

My second comment has to do with your statement that "industry is pleading with them /university employment counsellors/ to find girls trained as scientists, engineers, etc." The fact is, I believe, that girls are mostly needed in scientific and technical fields only in an "assistant" category - as laboratory technicians, as technical aides, and in this respect any girl with a natural liking for scientific knowledge and research but not so brilliantly equipped mentally will find jobs now where none had been open before the war (for instance, in the oil refineries testing synthetic rubber samples).

My third comment has to do with girls taking jobs as unskilled workers. (I might say in passing that the terms "skilled," "semiskilled," "unskilled," have little meaning today - the war has forced a dilution of job operations so that training can be a matter of weeks instead of years.) I assume you mean that girls are going into factories at the beginning jobs on the production line. Such experience, to my mind, will always stand them in good stead. Some of them will find eventual promotion to supervisory and even to personnel-administrative jobs. Many factories, and some research laboratories, prefer to train girls on the job, and so hire inexperienced persons, depending on the high school record and interview techniques to select the best ones.

To me, even though this is a war period and post-war problems are ahead of us, I believe high school girls should still be guided by their real desires in determining whether specialized advanced education should be encouraged. It is the choice <u>within</u> a certain field where advice would be

helpful. In nursing, for instance, I would suggest a girl go into public health nursing instead of bedside nursing; or, if the nurse-patient atmosphere appeals to her, into occupational therapy. In languages, I would point out that knowledge of a foreign tongue is useful as an auxiliary aid in a chosen field, rather than to treat it as the chosen field itself (unless teaching the language is the goal); for instance, the Treasury Department some months ago would have anyone - man or woman - who was able to read bank statements in certain foreign languages; and similarly, to know a language in the trade terminology, or in the labor terminology, of the country would, in connection with a student's major study of marketing or of labor economics, place her in a most favored position. Other instances could be given.

In all of this, I suppose information would be most useful to you if it relates particularly to California, as many of the girls will be seeking employment first of all in nearby areas. I feel sure you have secured all the statistics you can from the California State Department of Employment. California is a State with great diversity of industry, trade (both domestic and foreign), and professional opportunities, and in view of the government's policy to discourage in-migration to areas of critical labor shortages, your article will probably be developed around the California (and Pacific Coast) employment market.

Sincerely yours,

Mary V. Robinson
Director of Public Information

rfn

FOR VICTORY BUY UNITED STATES WAR SAVINGS BONDS STAMPS

AUTOMOTIVE WAR PRODUCTION

Vol. II No. 7 | Published by Automotive Council for War Production | July, 1943

War Output Continues Rise, Despite Conversion No. 2

Keeping Step with Shifting Military Requirements Calls for Many Changeovers in Automotive Plants

CONTRASTED with the tumult and turmoil of changing from motor cars to munitions, the automotive industry's "second conversion" has been a noiseless, unspectacular affair, though a most important one.

Like its predecessor, the latter day conversion has been accompanied by shifting of facilities, re-arrangement of machinery, pioneering of new methods and emergence of new products, some totally different from those which have rolled off the production lines before.

These products range from heavy trucks that swim like ducks, and which already have waddled with blazing guns into enemy positions, to 40,000 pound mounts for huge Navy guns which are proving such potent weapons in the current invasion thrust. These mounts are used on guns similar to those shown in the above photo.

To a considerable degree, the grand strategy of the United Nations is keyed to the speed with which the conversion to the newer weapons is made, in order to assure a balanced program for land, sea and air fighting.

Dictated by the shifting strategy of war, military requirements constantly are being revised. Some items have slowed down in recent months in automotive plants, while others have been halted altogether.

Military vehicle production, for example, provides a case in point:

In the last quarter of 1941, at the time of Pearl Harbor, military vehicles constituted 52 per cent of the total automotive war job. Twelve months later, it amounted to 29 per cent of the total production and, by April of this year, it was down to 25 per cent. A similar situation, though not quite so pronounced, exists in the tank and gun phase of the automotive war job.

Aircraft work by the automotive industry has come forward rapidly, accounting percentagewise for much of the drop in trucks, tanks and guns percentage totals. However, cut-backs of schedules and contract cancellations are also reflected.

Nevertheless, the automotive industry's production totals have continued to climb to new highs, month by month,

(Continued on Page 7)

HELP WANTED: FEMALE

Good Morale Programs Begin at the Factory Gate, As Automotive Plants Add More Women Workers.

While employment procedures vary widely, outlined below is an example of a personnel program developed by one automotive company. It shows the steps taken by a "typical" applicant, in this case a woman, in getting her first job in the company.

SO YOU *wish to do your part by becoming a war worker.*

In an automotive war plant, your first interviewer asks you to fill out an application form to see if your qualifications fit the available jobs. Then you are directed to the employment office.

If you've specific training, the employment manager puts emphasis on placing you in a job which will utilize your highest skill. Then, your weight, height and age are matched against the physical requirements of the available jobs.

Are you a short person? If so, he rules out jobs requiring you to work with hands outstretched over your head. If you are quite tall, then you shouldn't be assigned to a job where you'd have to lean down in a bent-back position. If your educational background is above average, then a highly repetitious job should be waived in favor of one calling for greater exercise of the mind.

If you are a woman—as many recruits today are—you are turned over to a woman counselor, once you are hired. The counselor, a mature, understanding person, explains that her job is to help you become acquainted with the plant and its policies, and to help you with your problems.

Matching workers and jobs.

"I know there are times when things come up that are personal or confidential," she says. "If that happens, won't you come in and talk them over? We may be able to help you straighten them out and save you embarrassment."

She explains the importance of the job that is waiting for you, and how vitally necessary it is to keep producing war materials for the men at the front.

She reminds that you should protect yourself and fellow workers against accident hazards at all times. The first safety rule, she says, is "Don't Run!" The second, "No Horseplay."

The clothing you wear should also be selected with safety in mind. Slacks and a shirt or blouse are required. Angora sweaters are out—they are fire hazards. Jewelry is not recommended. Sensible shoes are an important item in your wardrobe, she points out. You should get low or medium heeled shoes, well fitted, which both support and protect your feet. Protect your hair with a snood or a turban while you're on the job; loose hair catches in things.

Do you have adequate transportation to and from work? the counselor wants to know. If not, she explains the plant's share-the-ride program and tells you how you can participate.

Now let's go see what your new job is like, the counselor suggests. In escorting you to your department, she points out first aid and rest rooms on the way. Other landmarks in the plant are brought to your attention to help you get directions straight.

She takes you to the superintendent's office where you register and get your badge. Shift hours are explained, and you are told when to report to work. A trip to the time clock acquaints you with the technique of ringing your time card. You now are introduced to the foreman, who briefly describes to you the work that is being performed in the department where you will work.

The counselor takes you out of the plant by the same route, to help you get your bearings, then turns you over to the training director for instructions on your new job.

He explains the job, listing the principal steps, emphasizing the key points. Everything is ready—the tools you are to use, the equipment, the materials.

Running through the job, he takes up one step at a time and shows you how to do it. He repeats the operations. Then he asks you to perform them. Now he requests you to turn instructor and tell HIM how to do the job.

Once you show sufficient familiarity with the operations, the instructor puts you on your own. He checks you frequently to see if you are following instructions. You begin to look for key points, begin to ask questions: "Why is it done this way?" "How do you correct this?" "What's the purpose of this?"

After you begin to show satisfactory progress, the instructor starts tapering off his extra coaching and close follow-up. Now you ask his advice and help only when something unusual is encountered. Soon he tells you:

"You've got the hang of the job now. Report to your departmental foreman tomorrow. You are ready for actual production."

You go home, tingling.

YOU ARE A WAR WORKER.

The above procedure of an employee's first days on the job, patterned after the personnel program of one automotive company, points up a series of problems common to all.

In the period ahead, a big influx of new workers is expected in U. S. industry—young women and middle aged women, old men, physically disabled people, and many other persons entirely new to industrial jobs. The biggest source of new workers will be found among women, however.

"By the end of the year," Paul V. McNutt, chairman, War Manpower Commission, recently explained, "there will be nearly eighteen million women in the labor force, one-third of those in direct war production. These facts mean adjustment for the worker and adjustment for the employer."

The newness of the relationship between the employe and her job has prompted industry to undertake extensive study of ways to make the new

Automotive industry shares "know-how," in combatting manpower problem.

worker feel at home in the plant.

Groundwork for good morale in new employes is laid in adequate preparations for their hiring, experience in the automotive industry shows. First impressions often are lasting ones. Therefore, care is taken with such details incident to hiring as providing waiting rooms with seats and writing desks. Applicants are interviewed as promptly as possible, treated courteously, and upon being hired are warmly welcomed into the company. Pains are taken to explain to the new employe how he or she fits into the organization and the part the company's war products are playing in the war effort.

Women counselors, generally, are new to industry, having come into the picture since the number of female employes began to increase sharply. Not all automotive companies have them, and some that do apply other names to them, such as "matrons", "floor area supervisors," etc.

One automotive company with a growing number of women workers on its employment rolls has 34 women counselors on the staff. It is estimated that they talk to 250 women a day, either for job induction or to assist in overcoming problems of a personal nature. The counselors range from young well-trained social workers to elderly women who have raised large families. Their average age is about 40 years.

Another plant assigns one counselor to a given floor area in each department in which women are employed, and this woman acts as a "big sister" to the newcomers who are not accustomed to factory work. Among other duties, the woman counselor frequently goes to the foreman with matters of health or hygiene that the newcomer is reluctant to discuss with the foreman.

The entrance of women into industry has necessitated, in many cases, the expansion of plant hospitals and first aid stations. Safety rules set up for men have to be revamped for women, even though the latter may be performing similar operations. Separate rules are frequently required to point out the importance of low-heeled shoes, short fingernails, completely enclosing the hair, removal of rings, wearing of safety clothing. Plants in some cases have even rearranged or reprocessed the work to make it safer and more satisfactory for women.

Up to now the automotive industry has experienced less difficulty in attracting workers than almost any other industry in America. But with a manpower pinch looming in the future the various companies some months ago began to aid one another by exchanging "know-how" on methods of meeting manpower problems. Therefore, through the Automotive Council for War Production more than 500 companies in the automotive industry have undertaken cooperative action in this field, just as they did in meeting machine tool shortages during the conversion period in the days following Pearl Harbor.

Specialists of the industry have huddled over conference tables trying to map out the best procedures for caring for the new employe from the moment he or she fills out an application blank for a job in an automotive war plant. The nature of the industry's studies are indicated from some of the preliminary reports issued to date: Training and Upgrading; Worker Morale; Incentive Plans; Absenteeism; Personnel Policies; Housing and Transportation; Health, Safety and Nutrition; New Workers.

But as the manpower program is a changing one, the industry will not rest on the knowledge gained to date; rather, the industry's manpower experts will continue to cull the field for new ideas and effective results, so that production for Victory will not falter with the increased demands on the nation's manpower resources.

IT'S DONE WITH MIRRORS

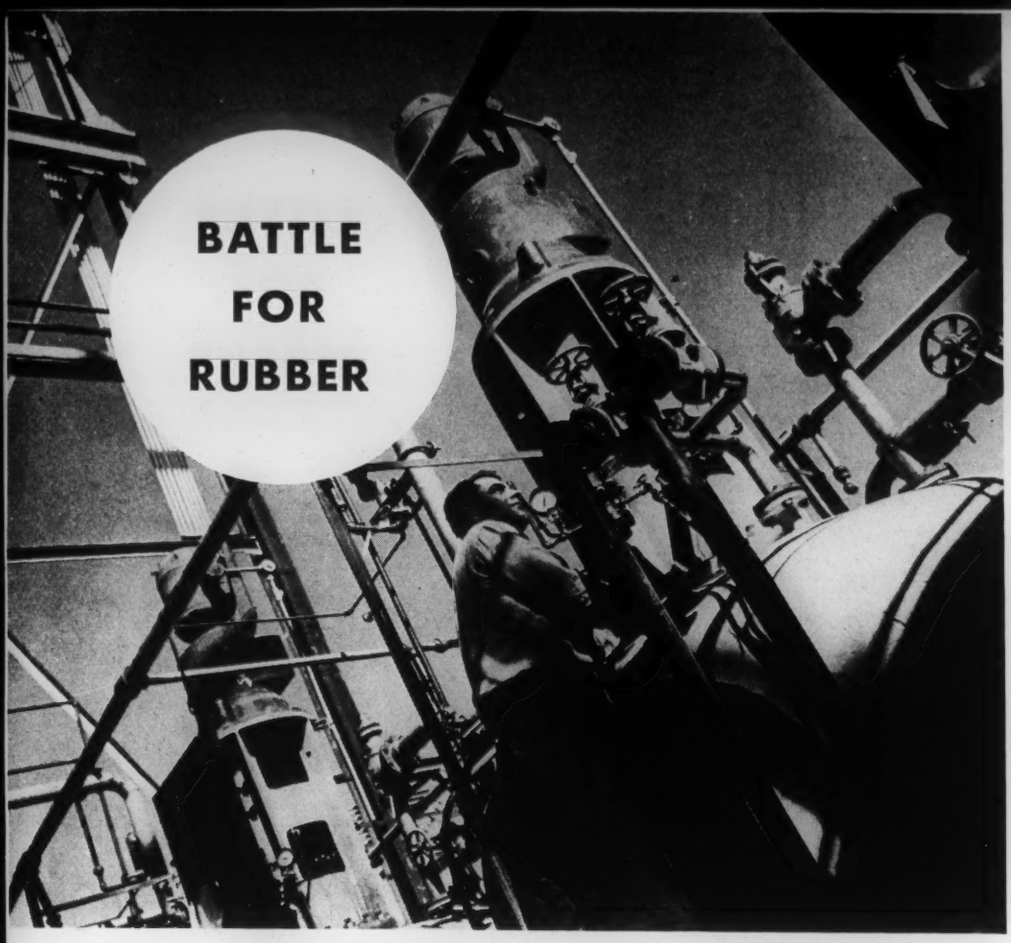
To a man it seemed right to plan the women's restrooms so that each wash basin would have a mirror directly above it. Indeed, pride was openly expressed by the personnel men who had just applied "the feminine touch" to this automotive plant's facilities in preparation for an influx of women workers.

But—

"It just goes to show you how little men know about women," said the company's woman counselor after one glance around the ladies' room. Summoning the maintenance foreman, she ordered the mirrors removed to the opposite wall, away from the wash stands.

"A woman," she explained, "spends more time primping than she does washing her hands. So a mirror over a wash basin is a bottleneck in a powder room."

To which the crestfallen male planners meekly replied with the apology, "After all, we've never been in a powder room."



BATTLE FOR RUBBER

Automotive and rubber research have progressed hand in hand.

WHEN the history of the present conflict is written, one of its most dramatic chapters will be the thrilling battle for rubber.

Recording it, the historian will be able to recall how Japanese treachery swept the United States to the brink of disaster in 1942, and how "Yankee ingenuity" transformed the blackest prospects of defeat into the brighter prospects of victory within the brief span of a year.

Today, the Japanese still hold the bulk of the world's rubber plantations which they seized a year ago—but, thanks to one of the greatest industrial achievements in history, the United States will produce more rubber next year than this nation, the world's largest consumer of rubber, ever imported from plantations in peacetime.

HOW IT'S DONE

No. 6

SYNTHETIC RUBBER

Japan's plot to control rubber supply is undone by the inventive ingenuity of free Americans working together for an outstanding industrial achievement.

At Institute, West Virginia, a new plant, sprawling out over 77 acres of what was weed-grown river bottomland a year ago, is now turning out man-made rubber at the rate of 90,000 long tons a year. This plant's output—as much as 100,000 plantation workers gather from 18,000,000 trees—is derived from chemical transformations of products from American acres and American mines.

At one end of the huge plant alcohol, ethylene and benzene are received. The alcohol, derived from either grain or molasses or petroleum, is processed into butadiene, a gas which turns to liquid at low temperatures. The ethylene and benzene are combined into styrene, a liquid which solidifies into a transparent plastic under certain conditions. Brought together in their liquid forms, the butadiene and styrene are combined by a series of chemical and mechanical processes into a crude "rubber" which, like natural rubber, is sent to rubber factories to be made into finished rubber products.

Week by week, month by month, other similar plants are being completed—in Pennsylvania, Kentucky, Louisiana, Texas, California, Ontario, and elsewhere. At the present rate of increase in productive facilities it is now estimated that, by the end of 1943, the nation's output of synthetic rubber will be rolling at the rate of 850,000 tons a year—considerably more than we ever drew from the plantations now held by our enemies.

The magnitude of this industrial accomplishment is hard to visualize. Of it, one observer recently said, "It was much as if we had decided to create the automobile industry in two years instead of 40."

That the grave danger of rubber starvation is diminishing so rapidly today is a tribute to the dogged determination of William M. Jeffers, the railroad executive who was drafted from the transportation industry to head the synthetic rubber program.

But that mass production of synthetic rubbers, as suitable substitutes for the more than 35,000 uses to which natural rubber had been adapted, is today a reality is due to the fact that other men—most of them relatively unknown—were working on rubber research years before the Axis formulated its plot against the U. S.

Shortly before his death in 1931, Thomas A. Edison warned: "In the next war, one of the first moves of our enemies will probably be to cut off most of our supply sources of crude rubber, so I am turning my attention to the producing of synthetic rubber."

Edison's alarm was not exactly unique. There were other far-sighted Americans who were acutely conscious of the perils inherent in the fact that the United States, using as much rubber as all other countries put together, was almost entirely dependent on the maintenance of a thin lifeline stretching half way around the world. This consciousness of national danger was especially pronounced among scientific men associated with the research laboratories of the American chemical, automotive and rubber industries.

In the years between the two World Wars such men proposed that steps be taken to provide for the development and production of synthetic rubber as insurance against the contingency of war, but neither government nor the public recognized the merit of their proposals. So, in a few industrial laboratories, the exploratory work went on, generally on a small scale.

It was natural that most of this exploratory work should be rather closely related to automotive industry

research, for the motor vehicle accounted for the bulk of the world's total rubber consumption. Originally, much of this early research was aimed at the adaptation of natural rubber to the tasks imposed upon it by the automobile—tasks for which natural rubber is notoriously unfit by reason of its deficiencies in the presence of petroleum products, heat and sunlight.

The research laboratories of the American tire industry were for more than two decades the principal battlegrounds upon which men fought to improve natural rubber's resistance to the destructive effects of gasoline, grease, lubricating oil, sunlight, heat and age. Their success is attested to by the fact that the average life of the automobile tire was multiplied scores of times in the period in which they applied their ingenuity to the task of rubber improvement.

And, as more tasks were found for rubber in the motor car and in its attendant services, the attention of automotive and rubber industry researchers turned more and more toward investigation of synthetic rubbers which could be "tailor-made" to perform specific duties for which natural rubber could not be adapted.

Though these synthetic rubbers were invariably much more expensive than natural rubber, their use was often justified by the fact that they performed better and lasted longer. So they got into such places as filling station hose, where natural rubber could not stand contact with gasoline; and in automobile engine mountings, water pump gaskets, fuel pump seals, carburetor diaphragms, ignition cables, grease retaining boots on propeller shafts and universal joints, etc.

By 1940 there were as many as 75 of such synthetic rubbers on one model of a low-priced automobile.

Indeed, the synthetic rubbers had become so essential to the efficient performance of automotive transportation that, by spring of 1941, when one of the synthetics became scarce as a result of wartime demands for one of its chemical components, automotive engineers were suddenly confronted with an emergency need for a mechanical design change because natural rubber, then still available, was not suitable as a replacement.

But, in contrast to the quantity of natural rubber used annually in the United States, our total consumption of such synthetic rubbers was small indeed. Germany, struggling for national self-sufficiency under the drive of Hitler, pushed forward rapidly in this field, producing eventually a type of synthetic rubber with a claimed superiority over natural rubber for use in automobile tires.

The Soviet Union, conscious of the threat of war from two directions, also spurred its chemists into accelerated activity in the development of domestic sources of both natural and synthetic rubbers.

In 1940, when the war in Europe began to spread alarmingly fast, the ominous forebodings of America's farsighted rubber experts began to receive more serious consideration than they had been accorded previously. Government and the rubber industry began to study the problem long before Pearl Harbor; but not until that blow was struck could the nation's rubber specialists hazard the danger of prosecution on monopolistic charges with an "all-out" pooling of the "know-how" they had developed and perfected competitively.

Among the heroes of this saga there are scores of men who worked anonymously to get things going, many of them men whose names will perhaps never be known by the public whom they served. Determined men, they compressed a decade of development into two years. In doing so, they risked much; for, almost without exception, the gigantic and intricate synthetic rubber plants now going into production were daringly created without the customary intermediate step of trying out in a pilot plant a process that looked merely promising in a small-scale laboratory experiment. One commentator said it was "almost like building a Flying Fortress out of the experience of flying a kite."

"It was a desperate gamble," one of the chemists associated with the program said recently. "But the stakes called for it, for those stakes were nothing less than the destiny of our nation. We now know that we need never be so helplessly dependent on distant plantations again."

Cooling 20,000 gallons of water a minute.

"Meat grinder" breaks up large pieces of synthetic rubber.

Jeeps and trucks aid in speedy recovery of U. S. battle-wounded.

Automotive Equipment Provides U. S. Soldiers With Hospital Facilities at Battle Fronts

WHEREVER American soldiers are fighting, the finest hospitals in the world are ready at all times to take care of battle wounded.

How can they build hospitals at the front? Well, they don't have to. For in the mobile units, that are coming from the assembly lines of the automotive industry, the Army has at its command medical facilities which are comparable to the most modern hospital in the country.

Take, for instance, the battalion aid station which operates from 400 to 1,000 yards behind the battle lines. This station, which is a minature hospital on wheels, is the first to receive the wounded soldier. Comparable to the emergency room in an ordinary hospital, it is staffed by two physicians and assistants and is equipped with operating instruments, sulfonamides to fight infection, anesthetics and opiates to relieve pain, hot drinks and blood plasma to combat shock and loss of blood.

After remaining long enough to receive necessary treatment, the soldier then is evacuated by ambulance-jeep or other conveyance back to the collecting station, much the same as being taken from the emergency room of a hospital to a ward for further treatment. This, too, is mobile, and can be brought up as close to the front line as necessary. Here complete records are maintained as to type of injury, recommended treatment, etc. Charts and orders of the physicians are as carefully maintained as in a large city hospital.

From the collecting stations the more seriously wounded are evacuated to field hospitals. Though these are also highly mobile and can be brought up to the front, they are usually maintained some 5 to 7 miles back of the battle line. The field hospitals are six-wheel units, capable of rapid movement over rough or soft ground. Equipped with the most modern medical and surgical supplies, they are staffed by expert surgeons, with specialists available for all kinds of injuries.

Farthest back are the base hospitals which are not mobile. Wounded men are brought to them by ambulance or ambulance-plane, since many are far removed from the battle area.

The automotive industry also provides other units which are used to care for battle-wounded or to maintain the health of American fighting men. These include bacteriological laboratories, and optical and dental units. Vehicles are used also to carry such equipment as X-ray machines and water purifiers to the front. A recent development is a trailer-borne plant which, designed for beach landings, distills ocean water into fresh water.

With such emphasis on medical care, it is apparent why recovery of wounded U. S. fighting men is running at better than 97 per cent.

22,000 Firms Share Automotive War Job

MORE THAN 22,000 individual companies located in 1,265 cities and 43 states are participating in the war job of the automotive industry, according to a preliminary subcontracting compilation by the Automotive Council for War Production.

Small business plays a big part in the industry's work. A number of plants employing 75 workers or less help build hydraulic brake controls, in a network of 38 small and medium-sized subcontractors working on the job. Interestingly enough, four of these plants have only two employes each, a "boss" and his assistant.

On another job, an automotive company has enlisted the help of 199 subcontractors. Sixty-two of these employ less than 100 workers each, 78 range from 100 to 500 employes, with the remaining 59 each employing more than 500 workers.

Automotive Plants Save Rubber, Copper and Tin

COMBINING ingenuity and enterprise with their background of "know-how," automotive engineers are assisting the nation to stretch its supply of critical materials.

On just a single Army vehicle, for example, a total of 107 items formerly made of rubber are now being produced from less critical materials such as felt, cotton, fabric, plastics and synthetics by an automotive company.

To concentrate the limited supply of copper into those weapons where it is irreplaceable, the automotive firm has re-designed 129 parts, turning to lead, felt, steel iron, plastics, die casting and other materials.

Of the 57 items on the vehicle formerly made of tin or tin-alloy base, automotive engineers substituted various materials and processes, among them being leather, felt, steel and iron.

Conversion Continues

(Continued from Page 1)

a testimony in itself to the speed with which the industry is converting.

In May, when the nation's overall arms output lagged, as revealed by War Production Board Chief Donald M. Nelson, the automotive industry showed an increase over the previous month by more than $25,000,000.

A 4500-pound amphibious truck, capable of carrying many soldiers over land or water, recently was put into production by one automotive company, taking up the slack caused by the lessening demand for standard military vehicles. The first of these units was engaged in actual testing operations only 38 days after the company received the original letter of intent from the War Department.

Geared for swift action, another automotive company is losing no time in converting anti-aircraft gun facilities —partally idle due to recent contract cut-backs—to production of 40,000 pound 5-inch dual purpose mounts for the Navy.

Having entered the machine tool field when a serious shortage existed there, another company has now shifted away from this work and into the production of gun breech housings.

Easing up of the tank program has resulted in one tank hull manufacturer turning to production of aircraft wings; another company, while continuing to make M-4 tanks in reduced quantities, has converted one assembly line to tank destroyer production and is preparing its plant for work on another armored vehicle; still another getting away from tank production altogether, is going into production on prime movers, huge vehicles needed by the Army for heavy hauling.

AUTOMOTIVE WAR PRODUCTION

Published by
PUBLIC RELATIONS DEPARTMENT
Automotive Council for War Production

HARRY A. WILLIAMS, Editor

New Center Building, Detroit, Michigan

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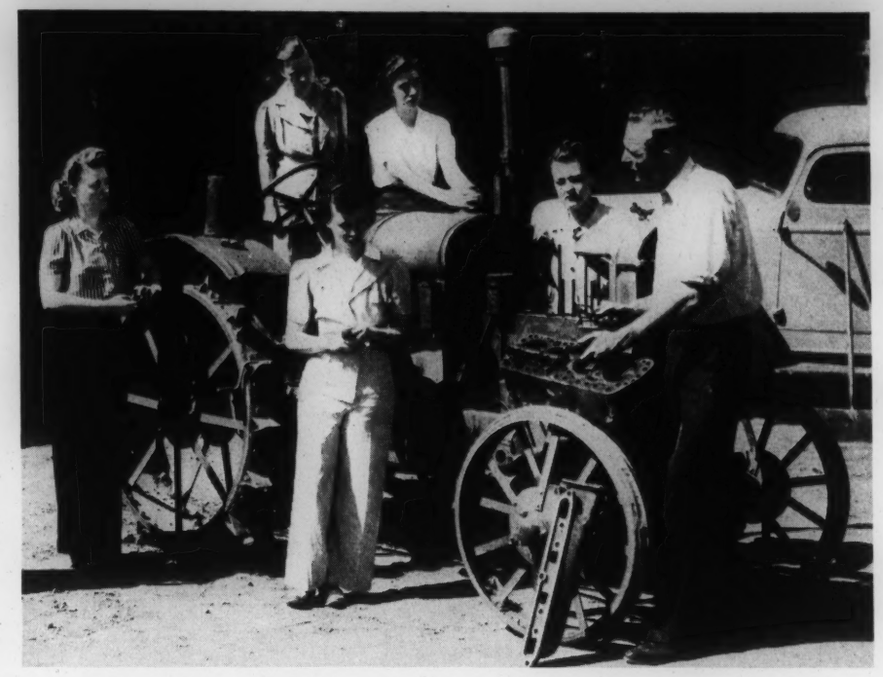

Fundamentals of engine care is part of automotive tractorette training.

Women Learn to Operate, Service Tractors Under Automotive Farm-Training Program

LIKE THEIR city sisters in war plants, farm women are now taking men's places "behind the plow," helping to provide more food for Victory.

Under a program of a former automotive manufacturer who also was one of the nation's largest tractor producers, thousands of women in all parts of the country are learning to operate and service tractors, so that they can take the place of a brother, son or husband gone to the wars.

The plan was originated shortly after Pearl Harbor when it was apparent that the farm labor shortage was becoming acute. Dealers of the company were called upon to furnish classrooms, instructors and machines, while the manufacturer provided teaching manuals, slide films, drawings and service charts.

All that was required of prospective tractorettes was a desire to learn and a disregard for grease under fingernails and smudges on noses, plus a farming background. The program was instantly and enthusiastically received. Enrollment lists showed wives, sisters, daughters, mothers and even grandmothers were participating. Ages ranged from 16 to 65.

Though their menfolk were a bit skeptical at first, the women tackled the job with a vigor, forcing them to change their tune in a hurry.

The tractor training course was divided up into eight lessons, with part of the instruction in classrooms, part in the field, and part in solo operation of tractors. Classes were broken up into small units so that each member could get as much individual instruction as possible.

They studied engines and transmissions, cooling systems and ignition. They learned to attach the major farm implements to tractors. And, they were taught not only the proper way to drive a tractor, but also the fundamentals of plowing, seeding, planting, cultivating and other tractor functions.

Safety was stressed in every lesson and one of the rigid requirements was that women be dressed in close-fitting overalls or slacks and shirt.

Many "graduates" of the course already are doing a man-sized job on their family farms, with the former cynical males occasionally getting pointers from wives or daughters on maintenance and safety methods.

The entire cost of the program was shared by the automotive company and its dealer body.

Industry Teamwork Accomplishes "Impossible" In Replacing Brass with Steel in Shell Cases

"THE DIFFICULT *we do immediately; the impossible takes a little longer.*"

This is the story of how the "impossible" task of substituting steel for brass in the manufacture of shell cases was accomplished when, in 1941, an alarming shortage of copper began to appear.

Though steel lacks most of the qualities needed for projectiles, U. S. Army Ordnance officers at that time summoned representatives of many companies with wide experience in making and treating and drawing steel to Frankford Arsenal to pool their "know-how" in an attempt to overcome the difficulties. Little success resulted from this initial conference; but the experts, returning to their shops and laboratories, carried back with them the challenge to attempt the impossible.

In an agricultural implement factory, one group of experts succeeded in making a shell case out of high-grade alloy steel, but this type of steel was becoming as scarce as copper and the manufacturing process was difficult and prohibitive in cost. Another group of experts of a steel company developed a chemically simple steel which, though it looked right, left the problem of drawing it into shell cases unsolved.

Concurrently, other groups were at work, in brass fabricating shops and in the factories whose peacetime products had been deep-drawn sheet-steel shapes such as automobile fenders, body panels, head lamps and similar units.

This experimental work, performed mainly on equipment that had been moved out of converted plants because it was not readily adaptable to war production requirements, resulted in several promising developments. One company, formerly a manufacturer of automobile head lamps, perfected a process whereby a "slug" of steel, resembling a hockey puck, could be shaped into a "cup" with a peculiar contour, so that the base would remain relatively thick while the walls were thinned into a long cylinder by successive draws on hydraulic presses. This process, shared by the companies working under the direction of the Ordnance Department's Steel Cartridge Case Industry Integrating Committee, was put into operation in several plants. And, within the surprising time of six months after the challenge was issued, a large segment of American industry was turning out steel cartridge cases by the millions for the smaller caliber weapons. Shell cases of 75 mm. caliber and larger were still troublesome, however.

Meantime, metal-working "know-how" acquired in years of manufacture of motor cars was concentrated on the larger calibers in an idle department of a former automobile factory. On ingeniously adapted equipment designed originally for the fabrication of automobile parts, techniques were perfected whereby the steel slugs could be hot-extruded at about 2,000 degrees F. into the first-stage cup and then drawn into a large-caliber case by a succession of cold-and-hot-working processes. This not only produced the desirable shape but put into the metal exactly that wide range of varying qualities required at different points of the finished product.

Although this record-breaking achievement of the "impossible" is a result of cooperative teamwork on the production front, the part played in it by the characteristically competitive habits of the participants is by no means an inconsiderable factor. For, although the several companies collaborated in the development, they clung to enough of their competitive traditions to remain contestants in the field of price. Hence, the armed forces are now getting streams of shells and cartridges in increasing quantities as a result of time-saving tricks competitively mastered, and at costs that have been reduced for the same reasons.

An unexpected dividend is that the substitute steel cases actually seem to be superior to the product which they are replacing. A recent Ordnance report indicates that the quality of the metal seems to improve with firing and that the cases may therefore be reloaded and used again and again.

With that report as a clue, one automotive company has just devised and put into operation testing equipment, which, simulating the effect of firing in a gun chamber, subjects the steel case to the stresses which seem to improve its quality. This company reports that no case thus tested has been rejected for physical failure.

WAR DELIVERIES RISE

Deliveries of war materials from plants of the automotive industry currently are running at an annual rate in excess of $8,400,000,000, it is shown in revised delivery figures for May.

During that month the armed forces received more than $700,000,000 worth of weapons. This was an increase of more than $25,000,000 over the previous month. June deliveries from automotive plants are expected to show an increase over May.

ADVANCE RELEASE

~~Mr. Tamm~~
~~Tyldesley~~
Return to Robinson
will file
in Profess. Women Folder

ADVANCE RELEASE: For SUNDAY PAPERS, July 11, 1943.
Howard-72006

OFFICE OF WAR INFORMATION OWI-2133

Official FBI Photographs to illustrate this release are available upon application to the Photographic Section, News Bureau, Office of War Information, Room 1405 Auditors Building, 14 and Independence, S.W., Washington 25, D.C. The photographs are numbered 33295, 33296, 33297, 33298, 33299.

An escaping Canadian army deserter ventured into a USO headquarters in Washington, D.C. There he met an attractive girl who invited him to call the next evening. He did, and met the friends roommate.

He may have thought the roommate eyed him sharply several times but they didn't talk business so he failed to learn that she was one of the growing army of women in the Federal Bureau of Investigation, and that one of her jobs was filing new "WANTED" posters.

The deserter left, anticipating future pleasant evenings, but a few days later he was safely in custody, en route back to Canada. The FBI girl, puzzling all evening over his resemblance to someone, had gone to her files the next morning, and pulled out "WANTED" posters filed the previous day. There he was, wanted by Canadian army authorities. It was but a matter of moments to report to her superiors.

Coincidence? Of course. But credit the young woman with the keen eye, the retentive memory, the sense of responsibility of her job which make FBI men enthusiastic over the work women are doing today in helping apprehend wartime criminals.

John Edgar Hoover, Director, says he cannot praise too highly the work of girls in his bureau. "In the technical laboratory, in the radio field and in finger-printing, their work has been capably performed. In technical fields they are rendering inestimable aid to special agents throughout the country."

Two years before America entered the war, reports the Office of War Information today, women totaled only 600 on the FBI roster. In the autumn of 1941, realizing that many of the FBI men would soon be in uniform (for the FBI is traditionally a young man's organization) the training of women was begun.

Six months later almost 4,000 women were at work, and that was only the beginning. By spring, 1943, there were 7,800 women in the FBI -- more than half the total personnel of 13,000 in field offices and Washington headquarters, almost double the number of women a year ago, and 13 times as many women in pre-war days.

Some of the busiest women are in the communications section. Wartime business of the FBI often depends on quickly arranged long-distance inter-office conferences. A wasted moment or mistaken order may mean the escape of a key saboteur. And it's women's flying fingers, plugging in and out with smooth efficiency. which set up and complete complicated hook-ups for these conferences. Between 14,000 and 15,000 calls are handled daily through FBI telephone switchboards.

X-17590

Regular communication with field offices is maintained by teletype in a code which the agency boasts is the only unbreakable one in the world. Three years ago, only three machines, operated by young men, were necessary to carry on this part of FBI communications. Today over a dozen machines are in round-the-clock use, and every operator is a girl. Only the supervisor is a man.

To reach offices in Alaska, Honolulu, San Juan, radio communication is used with a dot-and -dash system the exclusive property of the F.B.I., which has been training girls as dispatchers. In the Washington office they also maintain a two-way communication system with the F.B.I. cars in the District.

Near the teletype room is a code room, where out-going messages are coded, incoming ones de-coded. This, also an exclusively feminine bailiwick, is a job requiring utmost accuracy as well as secrecy. A miscoded or wrongly de-coded word might mean the difference between wartime disaster and its prevention.

Mail room girls in the FBI have a much more complex job than those in most business offices. In addition to official mail, hundreds of letters come in every day from patriotic Americans voicing suspicions, offering possible clues.

Girls open the letters, classify them for immediate consideration or admitting of slower action, separate "crank" letters from legitimate information, and route them to the proper person's attention.

The F.B.I. itself is still surprised to see women employed in the mechanical section, a department where work is considered heavy. Included among the duties of the girls is the printing up of the "wanted" notices which play such an important part in the apprehending of criminals.

In technical branches women also give splendid account of themselves, according to FBI officials. Women photographers record latent fingerprints that a suspected espionage agent may have left on a letter. They also enlarge specimens of handwriting and typewriter types for comparison with thousands of samples in the files. Their work is done with one of the largest enlarging cameras in the world.

A visitor to the cryptanalysis section must look twice these days to discover any men. Desk after desk is occupied by a girl, working over her problem with the fervor of a cross-word puzzle addict.

The women in this section are college or university graduates, holding arts or science degrees. Many, too, have studied languages in foreign countries under native tutors, giving them the advantage of the native viewpoint so essential to a complete understanding of the language.

Codes and ciphers of all types come under their examination, many in connection with wartime espionage writings. Their job is to break a code quickly enough to prevent accomplishment of criminal plans. In one case, prison authorities sent FBI crytographers a cipher in which girl laboratory technicians discovered a plot to smuggle hacksaw blades to prisoners. Though the code-breaking required hours of work, it was completed in time to prevent a prison break.

Document examiners, many of whom are women, must be able to recognize different types of handwriting specimens and to make comparisons which may lead to the capture of a criminal. They must be familiar with different types of paper and

with various water marks, so that a kidnap note, for example, can be localized down to the specific five-and-ten-cent store which may have sold the paper.

Through work of this kind, the trail of a bad check passer can be followed so quickly from San Francisco to New York, for instance, that shortly after the check is given to his New York hotel, the culprit is in the hands of the FBI.

Document examinations conducted by FBI women figured prominently in one historic criminal case ... that of Theodore Donay, tried and convicted for misprision of treason. This was the second time in this country that an individual was successfully prosecuted for the offense; Donay received a sentence of six years, and six months in prison and fine of $1,000.

The importance of the document testimony in the case was based on the fact that among Donay's possessions was found a letter written in 1939 to one Walter Gimpel, Altenburg, Germany, which had the closing, "Heil Hitler." The letter was written after the time that Donay had become a naturalized United States citizen.

On the witness stand, Donay refused to acknowledge the signature. Handwriting testimony, based on FBI girls' findings, proved it was his. The offense of misprision of treason was based on the fact that Donay assisted Max Stephan who in turn was aiding Peter Krug, a German prisoner who had escaped from a Canadian camp. Stephan was convicted of treason and sentenced to death. On the eve of the execution the sentence was commuted to life imprisonment.

If a raveled thread or a human hair needs microscopic analysis as a vital piece of evidence, the eye glued to the lens may be a woman's. If poison is suspected in a death, it may be a woman toxicologist who examines the contents of the victim's stomach. If an airplane motor fails for no obvious reason, is it sabotage? A girl in the chemical analysis laboratory may be the one to answer that question when she examines oil taken from the motor.

The work of women in the FBI chemical laboratory recently brought to justice the murderer of a U.S. army soldier. A private in an Alabama army camp disappeared. Three weeks later his broken body was found on the military reservation. Another soldier absent without leave from the camp at the time of the crime, was suspected. Located at his home in New York, he persistently denied knowledge of the death of his camp mate.

Examination of the suspects' clothing, however, revealed blood stains. The man claimed they had resulted from a nosebleed. FBI laboratory experts examined the stains, and proved that the blood was not that of the suspect, but was of the same blood group as that of the murdered soldier.

Dirt on the suspect's uniform was also examined, and found to have characteristics of soils in the vicinity of the crime. Confronted with this evidence, the man confessed the crime and was sentenced by a military court to life imprisonment at hard labor.

Recently seven persons were arrested for faulty welding at shipyards in Maryland which construct liberty ships for the Maritime Commission. Before the seven could be arrested, X-ray and other technical examinations had to be made of the welds since many were in vital parts of ships and discernible only by such analysis. FBI technicians discovered that the welders had used what is known as "bridge welding" or "slugging" methods which leave the weld structurally weak.

This evidence resulted in the suspects admitting they had used these quicker methods to accomplish more work and earn higher wages.

If a teeth-marked apple core is found near the scene of a crime, it may now fall to a young woman to make the impression of the core and its marks, using the wax "moulage" which is kept eternally cooking on the little electric stove in the laboratory.

Excellent work is also done by girl fingerprint classifiers currently being trained as fingerprint technicians. Because this latter science needs several years of training, men still dominate the fingerprint technician section, though practically all other jobs in the identification division are filled by women.

Filing may sound like a dull job, but not to FBI girls in wartime. Their work in Washington headquarters alone extends through an office area of some half million square feet, almost the equivalent of an 11½ acre farm, and they are responsible for the filing of reports on every individual case in which the FBI has a hand. Before the war, the staff of this section was 90 percent men; today it is 90 percent girls.

One woman is training to be an electrical engineer, and even the cartographic section, which demands a knowledge of mechanical engineering for drawing up charts used in counter-espionage is expected to be made up of women in the immediate future.

So important has the feminine element become at Washington FBI headquarters that one of two gymnasiums has been designated for women's use. Girls as well as men are kept in health by the nursing service which, of course, is another woman's department. Not only is first aid treatment offered in the building, but employees reporting by telephone that they are ill are visited at home by a nurse and given remedial care, if the illness is such that the nurse can treat it.

Getting a job with the FBI is no simple task, so those who hold them are justly proud. A junior cryptographer applicant, for instance, must be between 23 and 35, in good physical condition and able to meet certain standards of eyesight. She must have either a college degree with a major in modern languages, mathematics, physics, chemistry, or astrology, equivalent experience in cryptography and cryptanalysis, or very special abilities in modern languages.

Having filled these requirements and been put to work the junior cryptographer is required to pursue certain studies under experienced crytographers, including the study of some languages other than English.

FBI policy is to make promotions from the staff rather than the outside, provided present employees have necessary qualifications. All fingerprint classifier vacancies are filled in this way.

The FBI now is accepting applications for various clerical positions and girls and women are invited to apply. They must be at least 18 years old, and capable of performing "moderate" physical exertion. Visual acuity must be corrected to normal if glasses are worn.

All applicants must be high school graduates and citizens of the United States. Stenographic applicants must be able to pass a dictation test of 120 words per minute, a typing test of 45 words per minute. The same typing test is given

typing applicants.

Translator applicants must qualify in more than one foreign language and be able to translate both to and from English. For the positions of clerk and under-clerk (trainee) an applicant must qualify for assignment to indexing, filing or other clerical duties, but it is not necessary to be a typist.

Examinations for these positions are held at regular intervals in each of the bureau's field offices.

The San Diego Union

GIRL-POWER WITH BRAIN-POWER PROVES BOON TO WAR INDUSTRY Sept.5, '43

By Bert H. Davis

CENTRAL PRESS CORRESPONDENT

Nearly as often as America launches ships, some college or technical school graduates its latest crop of smart girls, ready to take brain-power jobs in war industry.

From a college graduate's cap and gown, a girl quickly changes to the shop garb of slacks and kerchief.

But she starts work in an advanced position. At the outset she is a sort of technical non-com or petty officer in the industry that is short of engineering and laboratory skills.

From Schenectady to Wilmington I have checked on the use that the war plants make of these girls who know calculating tools and procdures or who can handle the lab equipment with easy familiarity.

Industries that once held back on this experiment in recruiting brain-power are now enthusiastic about college girls.. Their scouts are out looking for under-graduate abilities and even urging high school girls, standing high in mathematics, to go on into industrial specialities.

RECRUITS PRAISED

"Super" Jim Simpson, Philadelphia, is one of the weary executives who brightens when you talk to him about college girl recruits, He says: "If it had not been for the girl-power, with brain-power I do not know where we would be today. We obtained girls from colleges and technical schools, induced the most experienced of our women to return from home-making and take on leadership jobs-and just loaded these folks with responsibility. Most girls put into tough spots in production and administration came through right on the beam."

In Schenectady the General Electric management pioneered in getting girls started through technical courses, with industrial jobs in view. Long before Pearl Harbor, they obtained the help of Rensselaer Polytechnic institute in nearby Troy. The 116-year-old professional school accepted its first girl students for engineering courses.

G.E. had another idea, to get the greatest possible good from skill such as Miss Mary McClurkin had. Mary, a mathematicis major, was set to work checking engineering training, to guard against any mistake in measurements and material orders.

However, several afternoons each week, Mary and her crew left the plant long before quitting time-while other workers watched out the window and no doubt envied the girls their short period on duty.

MORE THINGS STUDIED

This crew was going to the laboratories of Union college where the company was having them trained for more difficult types of engineering work. In this up-grading program, Union college, like Rensselaer, dealt with its first girl students.

Emily Hannan heads a staff of nine girls who "man" the turbine calculations department for General Electric. When a new ship of our Navy starts out to sink a wolf pack of submarines or some more easily seen foe, its high speed turbines behave according to specifications-because of the work done long before in Miss Hannan's depa rtment.

Miss Hannan's girls, mostly math majors from near-by colleges, are experienced hands with slide rules, planimeters, integrators and automatic Calculating machines. They turn out a steady stream of figures and graphs on what turbines will do, particularly what strains they will stand.

On every order that goes through the turbine shops, the engineers and shop foremen come to Evelyn Becker, Augusta Alger, Helen D'Agostino and the others of this crew for the "dope" on wheel stress, clearance and and type and strength of material required for certain vital parts.",

When new designs come out, the engineers may require all the time of one girl calculator for three or four months.

PROBLEMS SOLVED

In another plant Mrs. Alice O'Hara, who had three years of experience following college in checking power transmission losses, has returned from homemaking to a much more important technical job. Her preparation for the two totally different professional tasks was a bachelor of science degree at a teachers' college where she majored in physics.

"I didn't think I'd make a good teacher," Mrs. O'Hara told the personnel manager of her plant. "But I do like the problems that come up in an engineering laboratory."

Into her laboratory every day come samples of metals & ores, paints & enamels, fluxes and welding materials, to be checked for quality and absence of impurities.

Mrs. O'Hara's work is in spectrographic analysis, which means--

"I take a sample of the material," explains Mrs. O'Hara, "build it into a couple of electrodes which will pass an arc, and record the light waves that pass along the volatized part of the surfaces.

"The record is taken on a photographic plate. The lines shown in the spectra, or light waves, give a very complete story of what elements are to be found in the material that is being tested."

WORK DONE READILY

To Mrs. O'Hara, college-trained and laboratory experienced, this sort of thing is as natural as testing a cake with a straw.

In New Jersey a duPont plant has just introduced me to the new career of Mrs. Beatrice Wright, laboratory assistant in wartime industry.

Mrs. Wright, trained and qualified professionally for difficult forms of chemical analysis, has laid aside the housewife's apron in favor of laboratory garb, including safety spectacles.

Her husband, a former insurance salesman in Vineland, N.J., is serving in the Army Air Corps. The Wrights have a daughter 13 years old--who can be proud and happy about the effective wartime service of both her parents.

The axis does not have any comparable group of professional women prepared for industrial administration--woman's place, according to the Nazis, was in the home, you see!

Buffalo Evening News, Aug. 30,'43

HOBBY PAYS DIVIDENDS IN WAR WORK
Miss Chappelle Is Photographer In Airplane Plant

Ten years ago a little girl with blond hair and sharp green inquisitive eyes clutched her box camera and in the "sister-aping-older brother" fashion tagged after her "hero" as he took pictures with a "big camera."

Today that same girl, Miss Elizabeth D. Chappelle, daughter of Dr. and Mrs. Walter F. Chappelle, a little taller and with soft wavy hair and the same sharp, true eyes, carries nearly eight pounds of camera as she uses a speed-graphic in her work in the Elmwood plant of the Bell Aircraft Corporation; the older brother, First Lieut. Walter F. Chappelle Jr., gained plenty of experience as a newspaper photographer, also a western representative of a Rochester camera company and now is serving his country in the Signal Photographic Corps, Washington.

MAJORS IN LANGUAGES

There have been a great many changes in those ten years for the little girl. She completed her academic schooling, was graduated by the Buffalo Seminary and entered Allegheny College where she majored in modern languages with the aim of either being an interpreter, translator or teacher of languages.

All the time the influence of the little box camera and the older brother were in the background. In rapid succession more advanced cameras-the Kodak Bantam Special, then the Rolleiflex, a motion picture camera, next the Leica 35 MM-were mastered by the teenage girl until photography was her favorite hobby.

HOME LIKE FAMILY STUDIO

Her environment, with her natural aptitude, rapidly developed the hobby as everyone else in the Chappelle family soon became interested in taking, developing, printing and studying pictures also. When Miss Chappelle completed her college education she felt that she should get into war work instead of teaching languages.

After all, her photographer brother is in Washington; another brother, Maurice G., is in a war plant; another brother, Lieut. (jg) Robert N. Chappelle, USNR, is stationed in Washington; and a sister, Mrs. Jay Spafford Tracy Jr., is with her husband, Corporal Tracy, who is stationed in Ft. Monmouth, N.J.; and, last but not least Miss Chappelle's fiance, Mr. Edson Van der Meid of Livonia, has had 65 hours flying to his credit and is in the enlisted army reserves awaiting call.

PATRIOTIC INTEREST

Two months after college graduation, a little more than a year ago, Miss Chappelle started work in the purchasing department of Bell. But after six months, remembering her hobby, and, with the thought of developing it into a job that "would help the war effort as well as be suitable for carrying on after the war and marriage," she transferred to the still photography department.

For a while she was in the dark room, developing, contact printing and enlarging pictures. Then time was spent taking pictures for the plant magazines. Now her major work is using the Leica camera in following through an assembly of various parts of an airplane for the visual training department of the plant.

But her work is still Miss Chappelle's hobby-for after-work hours are often spent in experimenting in color pictures. And of the future - it is a natural. She hopes the war will end soon, then marriage... and she can always use her "war experience" in peace times, taking candid pictures of babies and their mothers.

WAR DEPARTMENT
Bureau of Public Relations
PRESS BRANCH
Tel. - RE 6700
Brs. 3425 and 4860

~~Wagenmeller~~
Return to Robinson

November 16, 1943

IMMEDIATE RELEASE

1,000 WOMEN DIETICIANS NEEDED FOR SERVICE IN ARMY HOSPITALS

To meet a critical need in Army hospitals overseas and in this country, 1,000 additional women dieticians will be required during the coming year to minister to the nutritional needs of the sick and wounded, the War Department announced today. Qualified women will be appointed in the Medical Department, Army Service Forces, in the relative rank of second lieutenant.

Stating that a shortage of dieticians exists in Army hospitals, Major Helen Burns, Director of Medical Department Dieticians for The Surgeon General, said: "We feel that our boys at the front, the sick and the wounded, should have the benefit of dieticians' services."

At present, a number of dieticians are serving in the commissioned ranks in nearly all the overseas theaters of operation. They are assigned to duty in evacuation hospitals, hospital ships and, in fact, wherever their services are needed. They plan the diets of patients, supervise the preparation and service of the food, and assist in ordering supplies, in maintaining sanitary conditions and in preventing waste. One of their most important jobs is instructing patients as to eating proper foods after leaving the hospitals.

Applicants for appointment must pass a physical examination, must be under 45 years of age, must be not less than 60 inches in height or weigh less than 105 pounds, and must be citizens of the United States, the Philippine Islands or of a co-belligerent or friendly country. A married applicant must not have dependent children under 14 and must agree to accept assignment unreservedly and to occupy available quarters at the station to which she is assigned.

Educational requirements include a degree from an approved college with a major in foods and nutrition or institutional management. The applicant also must

MORE

complete a dietician's training course approved by The Surgeon General, except that under certain conditions two years of hospital experience may be substituted.

The Army has training courses for dieticians at Walter Reed General Hospital, Washington, D. C.; Brooke General Hospital, San Antonio, Texas; Fitzsimons General Hospital, Denver, Colorado; and Lawson General Hospital, Atlanta, Georgia. Appointees for these courses are selected from the United States Civil Service lists of eligibles. Students receive subsistence and a small salary. Many civilian hospitals are cooperating with the Army by offering training courses.

Appointment as Medical Department dietician brings not only the relative rank of second lieutenant, but also the pay and privileges of Army officers of that grade, and overseas service adds a 10 per cent increase in base pay.

Information concerning appointments can be obtained by writing the field offices of the Officer Procurement Service in the following cities: Boston, Massachusetts; Philadelphia, Pennsylvania; Charlotte, North Carolina; Cleveland, Ohio; New York City, New York; Buffalo, New York; Baltimore, Maryland; Pittsburgh, Pennsylvania; Atlanta, Georgia; Nashville, Tennessee; Columbus, Ohio; Indianapolis, Indiana; Hartford, Connecticut; Albany, New York; Syracuse, New York; Richmond, Virginia; Birmingham, Alabama; Cincinnati, Ohio; Louisville, Kentucky; Chicago, Illinois; Milwaukee, Wisconsin; Omaha, Nebraska; Kansas City, Missouri; St. Louis, Missouri; Dallas, Texas; Houston, Texas; Salt Lake City, Utah; Trenton, New Jersey; Detroit, Michigan; Oklahoma City, Oklahoma; Denver, Colorado; Minneapolis, Minnesota; Washington, D. C.; San Antonio, Texas; New Orleans, Louisiana; Los Angeles, California; San Francisco, California; Seattle, Washington; and Portland, Oregon.

END

DISTRIBUTION: Aa, Af, B, Da, Dm, Me, N.
2:15 P.M.

For Release
Tuesday, June 29, 1943
Special to Frances Lide
The Evening Star

Note: Miss Hickey will install new officers of B & P at this meeting.
Virginia Price Rm. 5454
Social Security Building
Tel. EX. 4660 Ext. 3442

MISS HICKEY ADDRESSES BUSINESS AND PROFESSIONAL WOMEN'S CLUB
ON "UTILIZATION OF WOMEN IN WARTIME JOBS"
WASHINGTON CLUB - Monday, June 28th - Dinner

Excerpts From Talk

"The problem is no longer unemployment, but of how best to use our total and limited man and womanpower. As more and more men are called to arms and war production continues to expand, women must take up the slack. Our machines must be kept grinding out at high speed and to full capacity the implements of war. Every contract must be filled. Every deadline must be met. The battle of production must rage as furiously at home as the battle of our fighting forces in armed conflict abroad. There must be no break or blocking of a steady stream of food, clothing, weapons, from home to battle front."

* * * * * * * * * *

"There are by this time no manpower problems which do not involve the recruitment, training and placement of women in the ever-widening theatre of activity. Women are today, and so will remain for the duration, our largest labor resource. Not only the recruitment of women for those activities in which they have been customarily employed, but their induction into industries and occupations from which they were traditionally barred, has become an urgent necessity.

"By the end of this year, we are told, about 17,500,000 women will be at work in the civilian trades and services and with the armed forces. This means that a net addition to the labor force of close to 2 million women will have been made during 1943. Since nearly all the new women employees must be drawn from those not normally in the labor market, the trend must be toward recruitment of women who have retired and women who have never worked outside the home."

* * * * * * * * * *

"Employers, like other individuals, are finding it necessary to weigh old values, old institutions, in terms of a world at war. Acute labor shortages, coupled with concrete proof of women's successful performance in a wide variety of occupations, have served to overcome the doubts of some of the most reluctant

employers concerning the adaptability, efficiency, and endurance of women workers. Despite some remaining chilliness, many occupations and jobs traditionally reserved for 'men only', now, in die-hard desperation, open their doors to women. The greatest possible obstacle to complete fulfillment of this advance in women's work status is lack of trained women to seize some of the new and rapdily expanding opportunities. Caught unawares, too few women have prepared themselves for executive and technical jobs now open to them. Today the job seeks the woman. That line forming on the right is not one of jobseekers, but a rank of jobs looking for qualified women."

* * * * * * * * * *

"The change in the employer attitudes toward hiring women has been rapid during the past year and a half. In January 1942, employers were willing to hire women for only 29 percent of their job openings in professional, skilled and semi-skilled occupations. In July 1942, they were willing to hire women in 55 percent of these same job openings. The proportion of women at work in essential war production rose from 15 percent in May 1942 to 25 percent in March 1943."

* * * * * * * * * *

"A major problem is one of getting women into the jobs that must be filled today. If women are to be used to their full effectiveness in the war effort, a three-fold program must be developed and put into practice: (1) Eager and capable women now employed must be directed to jobs where they can use to the maximum their present skills; (2) others must be given encouragement and training to upgrade their skills to levels for which they are not now qualified; and (3) women not now employed must be reached through a vigorous recruitment policy.

"It is important to keep in mind that at present there are no reserves of unemployed persons in most of the needed semi-skilled, skilled and professional classifications. Training, therefore, becomes the most important tool. More reliance on training will help to reduce terminations. The employee who has been given a type of training which fits her to do better work and make more money is not apt to pack her bag. Unused skills that have suffered enforced idleness must be discoverd, reclaimed. A real inventory of skills of those now employed with an

adequate training program to refresh, strengthen and add skills will do much to meet new demands ahead."

* * * * * * * * * *

"The type of training that will make possible the most effective use of womanpower must become an integral part of management and supervisory procedure. It involves the careful screening for potential job skills, then rapid intensive training on the job for the job. Requirements must be anticipated so that good trainees can be attracted.

"A sound educational policy should be developed for the particular training needed today. Training specialists working closely with personnel people need to build the bridges from classroom to wartime jobs. There is no need to permit employees to learn piecemeal by old trial and error methods what can be mastered in intensive training. Short unit preparation courses could be given by many educational institutions along with basic training in needed skills."

* * * * * * * * * *

"Yes, many, many more trained women workers are needed now. The problem has shifted from that of convincing employers to accept women in executive or technical jobs, to one of getting women to equip themselves for these jobs in the shortest possible time.

"And when the day of victory comes, what then? It's true that we may have more workers than needed. But let's make certain that the weeding out process takes place on the basis of ability rather than sex - that job casualties are the result of inefficiency and not discrimination."

* * * * * * * * * *

Return to Robman

Women's Bureau
U. S. Department of Labor
Washington

Has Memorandum
MUR files

February 16, 1943

Memorandum concerning American Association of University Women's Conference on coordinating the resources of women's colleges with war industries employing college women. Conference held February 10th, 1943.

From: Bertha M. Nienburg.

This conference was historic in that it is the first time that industry has sought the aid of colleges in preparing women for professional jobs in industry.

Of specific interest to the Women's Bureau are the statements made by representatives of industry concerning their needs. The college presidents' statements were primarily in the form of questions.

Mr. Roy Andrews, Engineering Personnel, Glenn L. Martin Company. Glenn L. Martin graduates average of 10-1/2 students per week from their engineering training school and the same number from its inspection training school. On this basis he estimated that the aircraft industry would require about 10,000 persons with college degrees. These graduates are assigned to 31 positions in the Engineering Department. Among these are drafting with opportunities of developing into designers, computers, tracers, technical correspondence, editorial work, trouble shooters, that is, tracing hold-ups in the Engineering Department, preparation of manuals, in charge of interchangeability lists in the maintenance division; in the laboratory: chemical analyses, material developments, material substitutions, vibration testing, test report writing, and photographic work.

In the Standards Department: weight estimating and weight control, personnel work, engineering planning and estimating, library work; in the manufacturing department: such work as tool designing, materials control, work simplification were listed.

Mr. Andrews believed that the aircraft industry would be able to maintain a large part of its engineering staff in the post war period and that women who had made good would be kept on "if the government permitted."

Mr. J. E. Walters, Vice President, Personnel and Labor Relations, Revere Copper and Brass Company. Company has four plants: in one the employees are members of the AFofL, another the CIO, one has an independent union and the fourth has none. He stated that it was important for girls to be used in the Personnel Department to understand union organization and how to work with unions. He also emphasized the importance of women recognizing that there will always be a very large proportion of workers whom they do not like so that the impersonal attitude must be developed. Fields in which they could place women were as follows: Personnel Department - For this he wanted women who had an idea of industrial management, factory

economics, industrial organization, knowledge of cost of living, statistics, wage statistics, etc. In the Sales Department technical background of their products in relation to sales. In the Findnace and Accounting Department. In the Research and Development Division.

This company was asking for the girls above average in skill, above average in personal capacity, with a good record in campus activities and of good health and physical stamina. The company puts them through a three to six months course in which they are sent into the mill to check up on production, go through the Personnel Department and learn other phases of the business.

Mr. M. M. Boring, General Offices of the General Electric Company. Mr. Boring stated that their company had the largest diversification of war products; that there were 69 different engineering designing departments. He distinguished carefully between the work he considered called for college gradmates and the work that was of a sub-professional nature. Drafting was considered a job for high school girls. He also stated there were many jobs in the Accounting Department for high school girls. Only 96 girls are employed in the engineering designing departments that are on strictly professional work. Mr. Boring said that girls make better chemists than men. He believed that with large numbers of men being killed, there was a permanent field for women in electronics and physics.

Mr. E. J. Stocking, Assistant Chief, Examining Division, U. S. Civil Service, said that they were seeking girls for junior engineering at $2,000 regardless of type of work in college to take a 27 week course with one of the colleges under ESMWT.

Dr. Karl Lark-Horovitz, Head of the Department of Physics, and Director of the Physics Laboratory, Purdue University, called attention to the fact that the Army was requesting pre-induction courses in the 11th and 12th grades of high school, that the teaching of such courses called for 2,000 physics teachers. There were no such number available. He was urging the use of women who had specialized in physics for teaching. He also called attention to the fact that not every person can become a physicist. He advocated the use of tests both on high school and college students to see whether they showed aptitude for this science. This science aptitude test was developed by Professor Edgerton and Professor Britt in Pittsburgh.

Mr. R. L. Auten, Recruiting Office, Engineering Personnel Bureau, Curtis-Wright Corporation. This company has 800 women enrolled as trainees in engineering in seven colleges. These girls have from 1-1/2 to 4 years college with some work in mathematics and science. The course is divided into two sections: one preliminary dealing with the fundamentals of physics, electronics and designing, and the other with special study of specific job contents. He stated that this preparation was to meet 1944 needs.

Mr. Forrest H. Kirkpatrick, Director of Personnel, Planning, and Research, R. C. A. Victor Division, Radio Corporation of America. This company has established an engineering cadet program with Purdue University. Girls will be given intensive courses in electronics and radio engineering. Employees are being sorted over by aptitude tests as the first group to be sent to the university.

Mr. Wesley J. Hennessy, Director of Training Division, Grumman Aircraft Engineering Corporation, has 50 girls in training at Columbia University. College graduates preferably those majoring in Mathematics and Physics are chosen although general scholastic ability is considered. The course is six months in length. The first period is opened in ~~the~~ ESMDT in the Columbia Engineering Department. It consists of nine weeks of 40 hours. They review mathematics, are introduced to engineering mathematics, the use of instruments, etc. The next four weeks is spent at the Freeport Aviation School for shop mechanics where they study machine tools, machines, and terminology of the shop. During these periods they are paid $25 a week. They then spend three months at Grumman's Plant, supplemented by work in the Columbia class room.

One week is spent in each key department at Grumman's. After that the department for specialization is chosen. While studying in the plant, they are paid 70 cents an hour and put in a 52 hour week, making about $40.00.

From THE CONSOLIDATED NEWS (Of Consolidated Vultee at San Diego)
July 8, 1943.

MVR

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your copy

WOMAN ENGINEER BEGAN AS CLERK JUST YEAR AGO

An artistic soul, under control of a very practical mind - and there you have an idea of Mrs. Pauline Angel, Dept. 44, who is one of the only two feminine methods engineers serving Consolidated. She specializes as an investigator of employee suggestions working directly in the shops to check up on ideas to speed up production.

Just a year ago she started as a clerk in the Employe Suggestions group of Industrial Engineering. She applied herself so diligently to this study that, last February , she qualified as a methods engineer.

Her artistic talents were developed from study both at University of Arizona, where she majored in art and music, and at Chicago's famed Art Academy. Though born at Imlay City, near Detroit, she has lived for the past 20 years at Tucson, Arizona.

Her husband, Joe, formerly a Convair worker, has gone back to the good earth. He is doing contract harvesting up north. This, they both thought, was best for the war effort, though it forces them to separate for a time.

May 1, 1943

Basic Data for OWI Campaign on

THE DEMAND AND SUPPLY OF COLLEGE WOMEN GRADUATES
May to October 1943

PURPOSE:

1. To call the attention of employers to the availability of 76,000 young women who will be graduating from the schools and colleges of the United States before September 30, 1943.

2. To inform these young women of the opportunities open to them to use their special abilities and training in the war program.

3. To publicize the activities and services of USES; the National Roster of Scientific and Specialized Personnel; U. S. Civil Service; ESMWT courses (Bureau of Training, WMC and U. S. Office of Education).

THE SITUATION:

According to current estimates of the National Roster, 76,000 seniors and advanced women students will be leaving the colleges and universities of the United States before September 30, 1943, and will be available for employment.

They represent a new and untapped source of supply--one that is mobile, intelligent, young, energetic, strong, and healthy.

What are they prepared to do in the war program?

How many of them can be absorbed into the labor market for trained personnel?

The following data have been prepared in cooperation with the National Roster, WMC.

Figures compiled by the NATIONAL ROSTER are based on returns to a questionnaire distributed by the National Roster of Scientific and Specialized Personnel. Schedules were sent to all universities, colleges, professional and technical schools, teachers' colleges, normal schools, and junior colleges listed in the 1941-42 Directory of the U. S. Office of Education, and to certain unlisted institutions which appear to fall in one of these categories. Approximately 1,850 schedules were distributed and on January 15, 1943, 1,423 usable returns had been received. This number includes replies from 692 colleges and universities, 137 professional and technical schools, 172 teachers's colleges, 35 normal schools, and 387 junior colleges. In addition to these, 90 schools returned unusable schedules. Since this tabulation was made, 143 replies have been received. These replies will be included in a subsequent report. Also a further analysis by States.

(Note) Data on nursing enrollments apparently include many student nurses not pursuing courses of collegiate grade.

(Note) Many institutions did not distinguish pre-professional students from other undergraduates. The distribution of pre-professional students by "expected dates of graduation" are of doubtful significance in view of the varying periods of training required for admission to professional schools, and in view of the fact that a large proportion of these students enter professional schools without first receiving academic degrees.

THE DEMAND FOR COLLEGE WOMEN

The demand for trained technical and professional workers cannot be stated numerically, for obvious reasons. There are, however, shortages which these women can fill:

SHORTAGES:

Engineers:	Estimated demand.....40 -	50,000
	Men graduating in June.....	17,000
	Excess of demand over new supply....25 -	33,000

122 women expected to graduate by this year

Doctors, dentists, nurses, veterinarians:	unlimited numbers	
Teachers:	Elementary and secondary schools	10,000
Social Workers:	In community services	12,000
Industry:	needs 3 to 10 times the available supply of engineers, physicists, and production supervisors.	

Medical and Health Fields 5,000 - 10,000 needed immediately
Occupational Therapy
Physical Therapy
Medical & Psychiatric Social Workers
Technical Personnel in Hospitals

THE JOB DEMAND FOR COLLEGE WOMEN

For the TECHNICALLY TRAINED the demand will be greater in the next few months than ever before in the history of the United States. Many colleges report an increase of 100% since the war started.

Group 1. The demand is greatest for those who have had training in specific fields, notably mathematics, the physical, engineering, and medical sciences.

Group 2. There is a great demand for those who have had training in the natural sciences--biology, botany, zoology--in economics, geography, history, home economics, and psychology, especially if the secondary field of study has been in the subjects in greatest demand or in the languages of the Orient, the Slavic, and Scandinavian countries.

Group 3. The demand is more limited for those whose training has no obvious relation to the immediate demands of the war program for technical personnel, such as art, music, drama, and literature.

On the elementary and secondary school level, the demand for teachers is urgent; also in science, mathematics, shopwork, agriculture, and home economics, on the college level.

To amplify the above statements, the following groupings are submitted as a rough estimate. The demand, of course, will vary from one locality to another, dependent upon the local industries, the locale of the armed forces and other factors. The presumption, however, is that these new college graduates are a "mobile" labor force, free from family ties and other economic and personal considerations, to work where they are most needed, than any other single group of women

A. TECHNICAL FIELDS

Group 1
Accounting
Agriculture
Auditing
Chemistry
Dentistry
Drafting
Engineering
Mathematics
Medicine
Nursing
Office Work
Physics
Social Work
Teaching (Elementary & Secondary)
Veterinary Medicine

Group 2
Bacteriology
Dietetics
Economics (Statistics, Labor Analysis, etc.)
Geology
Immunology
Languages (Asiatic, African, Slavic, Scandinavian, Portuguese)
Library (Special, such as Medical, etc.)
Map Making (Cartography)
Medical Techniques
Meteorology
Nursery Schools
Nutrition
Occupational Therapy
Pathology
Pharmacy
Photography
Physical Education
Physical Therapy
Psychology (Social work, mental Hygiene, etc.)
Public Administration
Public Health
Recreation

Group 3
Architecture (except drafting)
Astronomy (Celestial Navigation)
Commercial Art
Journalism
Editorial
Public Relations
Geography) Except as second-
History) ary or in combina-
Languages) tion with other subjects, or teaching
Law
Public Administration
Radio Program Production
Motion Pictures (Photography and Production)

In all parts of the country there is a great need for workers in:

B. NON-TECHNICAL FIELDS

Communications: Telegraph and telephone; teletype; radio.
Transportation: Information; chauffeurs; mechanics; clerks and dispatchers; conductors; trainmen; traffic clerks.
Agriculture: Dairy; poultry; harvesting; food processing; packing.
Health and Welfare Programs for War Workers: Managers; clerks.
Child Care Centers: Laundresses; cooks; mothers' helpers.
Community and Personal Services for War Workers: Shopping; housecleaning; foster-care of young children, receptionist; clerk; inspector in housing and information centers for war workers.
Education: Clerical and janitorial workers.
Hospitals and Clinics: Receptionist; attendant; assistant in doctor's and dentist's office; clerical work.
Publications and Printing: Linotype operator; proof reader.
Retail Trade: Sales clerk; buyer; cashier; bookkeeper; stock-girl.
Restaurants, Cafeterias, Hotels, Boarding Houses: Housekeeper; supervisor; steward; food buyer; cook; waitress; switchboard operator; room clerk; manager; hostess; counter attendant.
Laundry and Dry Cleaning: Spotter; dyer; checker; sorter; marker; inspector; supervisor.
Service and Repair Trades:

PRELIMINARY REPORT ON REGISTRATION OF SENIOR AND GRADUATE WOMEN STUDENTS IN COLLEGES AND UNIVERSITIES POTENTIALLY AVAILABLE FOR EMPLOYMENT BY SEPTEMBER 30, 1943 -- Listing by major fields of study. These data represent returns from approximately 90 per cent of the colleges and universities.

GROUP 1:

SUBJECT:	GRADUATE STUDENTS		SENIORS
Accounting and auditing	26		327
Agriculture	27		159
Business	486		5,427
Chemistry	221		1,149
Dentistry	67		121
Education	2,593		13,489
Engineering	17		105
Mathematics	137		1,083
Medicine	80		235
Nursing	142		3,036
Nutrition	83		857
Physical Education	181		1,559
Physics	49		119
Social Work	1,459		1,208
Veterinary Medicine	6		10
Totals:	6,574		28,884
Grand Total:		35,458	

GROUP 2:

SUBJECT:	GRADUATE STUDENTS		SENIORS
Economics	263		1,376
Geology	28		107
Home Economics	461		6,872
Meteorology	6		9
Natural Science	377		497
Pharmacy	5		189
Psychology	334		1,541
Public Administration	140		115
Public Health and Hygiene	67		477
Totals:	1,681		11,183
Grand Total:		12,864	

GROUP 3:

SUBJECT:	GRADUATE STUDENTS		SENIORS
Architecture	5		111
Fine Arts and Languages	2,080		15,047
Geography	32		161
History	417		2,686
Law	36		217
Totals:	2,556		18,222
Grand Total:		20,778	

Total: Group 1 and 2	48,322
Group 3	20,778
GRAND TOTAL	69,100
Estimated 10 per cent increment expected from non-reporting schools	6,910
Estimated overall total numbers of senior and graduate women students potentially available for employment by September 30, 1943	75,910

Placement of Trained Personnel (College Women)

The United States Employment Service is cooperating with the National Roster in placing qualified women in technical positions, in both government and industry, particularly in the fields of the medical, physical and engineering sciences, economics, accounting and auditing. USES is also cooperating with the U. S. Civil Service Commission in placing women in Government agencies, including civilian personnel in the War and Navy Departments.

MADEMOISELLE

The Magazine for Smart Young Women

RSJ

ONE EAST 57TH STREET • NEW YORK • PLAZA 3-1030

April 21, 1943

Dear Miss Robinson:

We are sending under separate cover our personnel and engineering files which I promised you some time ago.

I hope that you will find them of value and a small compensation, at least, for all the trouble I have put you to in getting material for my government directives.

When you have finished with them, will you return them to us and we will add them to our active files?

With every good wish,

Sincerely,

MADEMOISELLE

Margaret B. Howser

Margaret B. Howser
Career Editor

Miss Mary V. Robinson
Director
Division of Public Information
U. S. Department of Labor
Women's Bureau
Washington, D. C.

MBH:vb

MVR
copy

Extracts from letter of Jan. 10, 1943, from Elinore M. Herrick [no title given]
Todd Shipyards Corp. to Mademoiselle. 1 Broadway, New York City

I don't think the young man or woman fresh out of college with only "courses" in personnel management has much to contribute at the outset. I am a great believer in the necessity for practical experience as a pre-requisite. The kind of thing that Antioch College students get where they actually work on the production line in factories as a part of their training in personnel administration is more valuable background than the actual "courses" it seems to me. I have induced a number of young college women to go first into a factory for a year - preferably dividing the year between several factories before seeking work in a personnel department. Unfortunately many young people want to start at the top, and I honestly do not feel that they can do as good a job without the first-hand experience. Perhaps that is because I started that way - but I shall never forget my early experience in how personnel offices should not be run - principles that I ~~learned~~ learned through being hired and fired by methods good, bad, and indifferent! You can't learn how the new factory employee feels and reacts to his or her treatment on the job just be reading books.

Also practical experience helps to overcome the handicap of immature judgment and lack of experience in knowing and evaluating people.

I think there is a field of opportunity related to - but not distinctly personnel - where the younger woman fits in well. We have, for example, what we call Field Representatives who are the link between the personnel department and the foreman or production supervisor. Here, too, practicaly factory experience is a pre-requisite. The job is that of helping the new employee to adjust to the job, explaining the rules, introducing them to the department to which the new worker is assigned, following them up to see how well they are learning, finding out why they are absent, providing a connecting link with the Medical Service departmet if that is indicated, reporting back to the Personnel Department on the success or failure of the placement.

names on letterhead

Todd Erie Basin Dry Docks Inc.
Brooklyn, N.Y.

Todd Hoboken Dry Docks Inc.
Hoboken, N.J.

Todd Combustion Equipment, Inc.
New York City

Todd Mobile Dry Docks, Inc.
Mobile Ala.

Todd Galveston Dry Docks Inc.
Galveston, Tex.

Houston Shipbuilding Corp.
Houston, Tex.

Seattle-Tacome Shipbuilding Corp.
Seattle & Tacoma, Wash.

Todd Seattle Dry Docks, Inc.
Seattle, Wash.

South Portland Dry Dock & Repair Co.
South Portland, Maine

Todd-Johnson Dry Docks Inc. (affiliated)
New Orleaas La.

Todd-Bath Iron Shipbuilding Corp. (")
South Portland, Maine

South Portland Shipbuilding Corp. (")
South Portland, Maine

MKR

Extracts from letter of Jan. 15, 1943, from John W. Vance, Asst. Dir., Public Relations, International Harvester Co. (Chicago) to Mademoiselle.

We have a number of women at the present time partly engaged in industrial relations work, and a smaller number entirely engaged in that work. In the general office Personnel Department we have a woman official whose title is "Supervisor of Employment and Service" and who has general charge of all women employes of the Company whether in offices or in factories. Under her direction women in factories are trained either for supervisory work on production, or for partial industrial relations work.

It is not our practice to hire women as industrial relations officials. The women who are now exercising industrial relations functions in factories have all begun as factory employes on production. We select for training as women supervisors on production work, girls with the best educational foundation we can find in the shop and, of course, girls that we think are leaders. They are then put through a 13-week supervisory training course in which they are taught Company policies, laws affecting women, and the standards of the Company concerning women employes. These girls agree, at the time of entering the training course, that they will be willing to go to any plant of the Company even if it means leaving their home town. A number of these women, after having reached supervisor's status, are used in plant industrial relations departments on a part time basis for interviewing and selecting new female employes.

Thereafter, the women supervisors check constantly during the learning period to make sure that new girls are properly instructed. They check production as to amounts and quality; they make recommendations as to rates of pay, progress or transfer to other work; they check absenteeism, check personal health records and check the girls' jobs from a safety angle; they determine whether certain jobs should be filled by girls and make recommendations accordingly to the management; they advise female employes in connection with personal problems and consult with such employes in the endeavor to eliminate grievances; they recommend promotions and keep in constant contact with department foremen so as to be in position to anticipate layoffs or the possibility of requiring additional help; they check constantly on pregnancy cases and see that pregnant girls are placed on lighter jobs, if necessary; they also endeavor to discover pregnancy cases if these are not reported by the employe; they exercise constant supervision over female employes in connection with discipline, sanitation and working conditions.

I think the salient factor in our use of women as supervisors and as part time industrial relations people, lies with the insistence on their having had actual shop experience themselves and come up through the same route that the girls under their charge are following.

WOMEN DOCTORS GET HIGHEST PAY

Survey by Club Federation Shows They Lead Professions in Earning Power

TEACHERS AT LOW LEVEL

More Than 50% Reported With Incomes of Less Than $1,500—Lawyers Rank Second

Women doctors are the highest paid of any feminine professional group, a survey completed by the National Federation of Business and Professional Women's Clubs shows.

Of the 227 physicians, surgeons and osteopaths reporting, thirty-seven, or more than 16 per cent, earn between $5,000 and $10,000 a year. Eight make $10,000 or more. Median yearly income for the doctors is $2,835.50, compared with $1,547.50 for the entire professional contingent, and $1,408 for the business and professional women combined.

Teachers, for the most part, struggle along in the lowest income brackets, with more than half reporting that they earn less than 1,500 a year. Only one of the 6.616 federation members in this group is making between 5,000 and $10,000. Social workers are just above the teachers in earning power. Nurses come next.

Second highest paid group in the profession is law. While seventeen lawyers report that they earn less than $1,000, nineteen of them earn $5,000 to $10,000, and two make more than $10,000. Accountants are next in line, leaving the librarians in the middle brackets.

In clerical jobs, secretaries lead all the rest. Out of more than 2,000 secretaries, seven are in the $5,000 to $10,000 category, and two make more than that. Stenographers and bookkeepers appear to be fairly close in earning power, with the stenographers dropping slightly behind in the upper brackets.

Members of the federation, classified according to States, reveal that proportionately more women in New Mexico than elsewhere are making more than $10,000. Washington, D. C., and New York are next in line. On the other hand, 47.3 per cent of the women reporting from Vermont are earning less than $1,000. Proportions in this category are almost as high for Arkansas and Kansas.

WOULD DRAFT WOMEN

Studies Link Fast Growth of Teeth With

throughout life they are the most durable.

There is a biological principle that fast-growing tissues are more liable to damage than slow-growing tissues. This appears to apply to human [illegible]th. There is visible evidence in [illegible] teeth to support this idea.

[illegible]id-growing teeth often [illegible] where the enamel [illegible]ots [illegible]re [illegible]re- [illegible]th. [illegible] the [illegible]ult [illegible] one [illegible].

[illegible]e [illegible]g [illegible]s

Women Get Highest Salaries In Medical Field, Survey Shows

By the Associated Press.

NEW YORK.—If it's a high-paying job that milady's looking for, the medical profession is the best bet and New Mexico is to spot to set up business.

So says the National Federation of Business and Professional Women's Clubs which surveyed the feminine employment field and found woman physicians on top, followed, in the professional field, by lawyers, accountants and librarians.

Teachers, for the most part, struggle along in the lowest income brackets, the federation said. In clerical jobs, secretaries lead, but stenographers and bookkeepers are fairly close in earning power.

Federation members, classified according to States, show that proportionately more women in New Mexico than in other States are making over $10,000. The District of Columbia and New York follow.

In Vermont, however, 47.3 per cent of those reporting earn less than $1,000. Proportions in this category are almost as high for Arkansas and Kansas.

Of 227 doctors, surgeons and osteopaths covered in the survey, 37 reported $5,000 to $10,000 yearly incomes. Eight said they made more than $10,000.

The average physician's pay is $2,835.50, as against $1,547.50 for the entire professioinal group, and $1,408 for business and professional women combined.

More than half of the school teachers reporting draw less than $1,500 a year.

Out of more than 2,000 secretaries, seven are in the $5,000-to-$10,000 bracket and two earn more than that.

Hen's Right to Cackle Over Egg Defended

By the Associated Press.

BUTTE, Mont.—City ordinances [illegible] the contrary, a hen that wouldn't [illegible] a freshly laid egg hardly [illegible] board and room, [illegible] grower [illegible]hat

New Coal Grate Radiates Efficiency

By the Associated Press.

LONDON.—Scientists of the British Coal Utilization Research Association have produced a domestic grate which is the answer to the householder's prayer.

Once lit it can be kept on indefinitely. The ashes need be remove[illegible] once a week. It radiates 4[illegible] of the heat in fuel, inste[illegible] [illegible]t of the ordin[illegible] [illegible]mption

Farm Posty

Votir unless the far confere their pu they fo in Auck. F. C. said th. should f improver give the which to

Delegat lution po with whic been emp

L

WOMAN COURT CLERKS—Four women now are serving as clerks in both the Municipal and District courts to replace men who have been called to duty in the armed forces. Shown above are Mrs. Helen F. Kloman (left), clerk in Judge Walter J. Casey's Traffic Court, and Miss Genevieve Yonkers, clerk in Judge Nathan Margold's Municipal Court. —Star Staff Photo.

Four Women Serve As Court Clerks in Wartime Innovation

Arrange Docket, Swear In Witnesses, Keep Records; Lawyers Praise Work

The masculine atmosphere which once marked the District's courts is undergoing a rapid change these days with the appearance in Municipal and District Courts of women clerks.

To a large extent a wartime innovation, as the male clerks are being called into the armed forces, two women are serving in Municipal Court and two others are in District Court.

A clerk's function is to "run the court" to the satisfaction of all concerned—the judges, lawyers, witnesses and defendants. Their duties consist of arranging the cases on docket, swearing in the witnesses, keeping the records straight and doing the judges' secretarial work.

Seeks Law Degree.

Mrs. Helen Kloman, 37, 2828 Sixth street N.E., is serving as substitute clerk in Judge Walter J. Casey's court. When Judge Casey's regular clerk, Howard Stewart, goes into the Army, July 17, Mrs. Kloman will

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Seeks Law Degree.

Mrs. Helen Kloman, 37, 2828 Sixth street N.E., is serving as substitute clerk in Judge Walter J. Casey's court. When Judge Casey's regular clerk, Howard Stewart, goes into the Army July 17, Mrs. Kloman will succeed him. Mrs. Kloman, who is now attending George Washington University for a law degree, has worked since September in Municipal Court as a junior deputy clerk. She has a 17-year-old son, John M. Kloman, in the Army Air Forces.

Miss Genevieve Yonkers, 1320 Quincy street N.W., who is serving as a substitute clerk in Municipal Court of Judge Nathan Margold, is a member of the Women's Bar Association. Now a senior deputy clerk, Miss Yonkers started working in the courts in 1937. She intends to practice law.

In District Court, Miss Eleanor Jobes, 32, 2200 Nineteenth street N.W., is a clerk in Motions Court. Miss Jobes is the first woman court clerk in this jurisdiction. A court employe since 1932, she was appointed to her present position in October, 1940.

Mrs. Sophia Lyman, 113 Kennedy street N.W., has been in Pretrial Court since February. She is a graduate of National School of Law and is a member of the bar association. She is the wife of Josiah Lyman, an attorney.

Work Brings Praise.

The women's ability to handle their jobs so ably brought tributes from Walter Bramhall and Col. Charles Stewart, chief clerks of Municipal and District Courts, respectively.

The finest compliments, perhaps, have come from attorneys, who are notoriously hard to satisfy on courtroom procedure.

One attorney expressed his viewpoint thus:

"I never thought it could be possible, but all these girls are 'regular fellows' at handling cases speedily, effectively and fairly."

OCCUPATIONS PROFESSIONAL & TECHNICAL - 1944

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU

To—		From—	Re Attached Please—
	Anderson.		Approve
	Nienburg.		Comment
	Larrabee.		Note
	Benham.		Note and return
	Best.		Reply
	Erickson.		Draft of reply
	Files.		Signature
	Hyde.		Would like to discuss
	Manning.		File
	Mettert.		
	Pidgeon.		Date
✓	Robinson.		Note:
	Smith, F.		
	Spring.		
	Steel.		
	Stitt.		

GPO 14—3769

Miss Robinson's copy

December 28, 1944

e to reply to your memorandum of
about schools of physical therapy

included in our medical series
in the Government Printing Office.
available for distribution within the
next month.

Meanwhile, I am sending you some excerpts from extra copies of the manuscripts which do give some information about the schools. You may also wish to refer those who inquire for free material to: The American Occupational Therapy Association, 175 Fifth Avenue, New York, New York, and the American Physiotherapy Association, 1790 Broadway, New York, New York.

The following persons in the Surgeon General's Office in the War Department can supply detailed information concerning the requirements for Army therapists. For physical therapy, Major Emma Vogel, Director of Physical Therapists, and Mrs. Winifred Kahmann, Chief, Occupational Therapy Branch, Reconditioning Division for occupational therapy.

We shall send you copies of the complete pamphlets as soon as they are available.

Sincerely yours,

Marguerite W. Zapoleon (Mrs. L.B.)
Labor Economist

MWZ/ml

Enclosures

Miss Robinson's copy

December 28, 1944

Mrs. Mary Currier
294 Washington Street
Boston 8, Massachusetts

Dear Mrs. Currier:

Miss Robinson has asked me to reply to your memorandum of December 23rd regarding information about schools of physical therapy and occupational therapy.

These two occupations are included in our medical series and the manuscripts for both are now in the Government Printing Office. We hope that the pamphlets will be available for distribution within the next month.

Meanwhile, I am sending you some excerpts from extra copies of the manuscripts which do give some information about the schools. You may also wish to refer those who inquire for free material to: The American Occupational Therapy Association, 175 Fifth Avenue, New York, New York, and the American Physiotherapy Association, 1790 Broadway, New York, New York.

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MWZ/ml

Enclosures

Professional

WHAT CHANCE FOR A PROFESSIONAL CAREER?

(Source: Independent Woman, September, 1944)

Among the professions involved in these human welfare fields, in which I think there will be a vast development for women, that of medicine will hold a leading place. Medicine is a congenial field to women, despite the fact that there are not many women doctors in this country. In Russia, women are in the majority among the physicians and surgeons, and that tendency seems to be growing. In this country, it is not easy for a woman to get medical t training, because the percentage of women students in the great medical schools is rigidly limited.

I have heard deans of medical schools say gravely, "Many women do not use this highly expensive medical training. They get married. They give it up. Why should we spend five thousand dollars a year on a woman medical student if she is not going to use the training afterwards? We have more men candidates that we can take. Why should we take in any women?"

So far as I am aware, no actual statistical study of what happens to women graduates of medical schools was ever made until lately when two friends of mine did make a study of the women graduates for the past twenty years of six of the leading medical schools of the country. Following up the graduates they discovered that 639, or 89 per cent, were doing full-time medical work and a good many others were doing part-time work or were planning to return to full-time medical work when their circumstances permitted.

OCCUPATIONS

PROFESSIONAL + TECHNICAL - 1945

COPY

November 8, 1945

Mrs. Windsor Doherty
873 Loraine Avenue
Springfield, Illinois

Dear Mrs. Doherty:

In response to your request for information in regard to starting a small business we are asking the Bureau of Foreign and Domestic Commerce, of the U. S. Department of Commerce, to send you a publication of theirs entitled Check List for Establishing a Retail Business. In general, I may say that instructions of this type are not in line with the work of the Department of Labor but more directly with the work of the Department of Commerce.

It is probable that you could obtain the best help from a local branch of the Committee of Economic Development if one is in existence in your city. The local Chamber of Commerce also is another agency that might assist you. It is probable that you could gain knowledge through them of some type of brief training course that would help you.

We also can refer you to a book entitled A Small Store and Independence, by David B. Greenberg and Henry Schindall. This has been published very recently (1945) and might be available in your local library, or they might be willing to get it for you. If not, perhaps you could buy it from the Greenberg Publishing Co., 400 Madison Avenue, New York 17, New York. The price is $2. A review of this book indicates that it has chapters on the following subjects: A choice of business; Amount of capital necessary; Location, rental; How to buy and finance; Principles of retailing; and Record Keeping.

Hoping some of this information will be helpful to you, I am

Yours sincerely,

FriedaS. Miller, Director

MEP/ml/pac

December 21, 1945.

Miss Ingvald E. Andersen
1089 Purchase St.,
New Bedford, Mass.

Dear Miss Andersen:

I am sorry to be so late in replying to your letter of November 24, but illness and a move of the office preventing an earlier answer.

The U. S. Civil Service Commission uses its translator's examination list for the very few appointments that may be made as a translator. At present there are enough persons on the translator's list to fill anticipated needs and the examination is, therefore, not open to new applicants at this time. Ordinarily the Commission has more difficulty in finding persons who know the Asiatic languages than they do in finding persons who are fluent in the European languages. However, Scandanavian languages are good to have, since there are fewer people qualified in these fields than French and German.

The State Department which does not hire employees of this sort through Civil Service, has a Translation division in which there are also no openings at the present time. They apparently have no difficulty in finding the persons they require who must be able to speak, write, and read in five languages of which English may be one. Although there are no vacancies you may wish to write to the personnel office of the State Department when you are ready to apply.

The Federal Bureau of Investigation is the other principal agency for employing translators, and which does not hire through Civil Service. Here, too, there are no vacancies at present and future application should be addressed to the director of the Federal Bureau of Investigation. Here the principal languages needed are German, Balkan languages, Russia and Japanese, since far too many are available who are fluent in Spanish and French.

I hope this information will be helpful, even though there is no immediate prospect of employment and total jobs in this field are few in number in government service.

Sincerely yours,

Marguerite W. Zapoleon

I am returning your self-addressed stamped envelope as it will not be needed.

MWZ/nb

OCCUPATIONS -RADIO

U. S. Department of Labor
WOMEN'S BUREAU
Washington

December 8, 1942

WOMEN IN QUARTZ CRYSTAL FINISHING

The manufacture of quartz crystals

Quartz crystals are essential in radio transmitters to control wave lengths. To fulfil their purpose these crystals must be cut and ground with great accuracy as to thickness and with the faces parallel.

The large raw crystals are carefully inspected and marked for cutting so as to obtain the greatest possible number of "blanks". Several cutting operations by means of revolving metal disks are carried out at approximately the correct a ngle of cut.

X-rays help determine the exact angle of subsequent grinding operations on the crystal blanks. Grinding, machine lapping, and hand lapping follow, and in the later stages the crystals are checked for accuracy.

Women in crystal departments

In a survey of selected war plants by the Women's Bureau last summer in a large industrial State, about 125 women were found working on various processes in crystal-finishing work (processes described below). Wage rates of the women employed ranged from 50 to 65 cents an hour. The minimum age for all women employees in the plants in which these women worked was 18 years. In one case single women, or married women with husbands in the services, were preferred by the firm.

In the crystal production observed by Women's Bureau agents women were doing both hand and machine lapping of the crystal blanks. A very few women had done so in August 1940 (two years previous) but the operations since then were changed and made much more specialized.

Women operate C angle indicators, to determine the natural axis of the crystals. They wax crystals on an automatic hot plate, or mount the crystals on wooden blocks in wax trays. Some girls are working as X-ray inspectors in an insulated X-ray room. They receive frequent medical examinations to prevent any ill effects from the X-rays.

Other operations done by women include mechanical gauging and sorting of the crystals, operating slit saw machines, which cut with diamonds to square the quartz, and matching crystals by machines. This last operation involves reading the meter on a machine to determine whether a crystal matches a master crystal, and grinding with emery on a glass plate to bring them into agreement.

Other information on quartz crystals

Brazil is the only important producer of quartz for radio control purposes. It may be possible to obtain information as to Brazilian quartz mining and miners by writing to the Inter American Division, Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington. D.C.

Articles and publications that might be consulted for information on quartz include:

Baldwin, C.F. "Raw Quartz Crystals." General Electric Review, July 1942. (Published by the General Electric Company, Schenectady, New York, 30c a copy)

"Strategic Crystals: Brazilian Government Acts to Stabilize Quartz Market. . ." Business Week. November 15, 1941.

Kerr, P. F. "Brazilian Quartz: A Strategic Mineral." Mining and Metallurgy, July 1942. (Published by the American Institute of Mining and Metallurgical Engineers, 29 West 39th Street, New York City. 50c a copy)

Rutledge, H. T. "Radio Changes Its Tune: How Industry Produces Crystals That Hold Br oadcasting Stations on Their Frequencies." "Scientific American. March 1941.

United States Bureau of Mines, Department of the Interior. Information Circular No. 6472. Quartz and Silica.

"WAR DEMANDS FOR TRAINED WOMEN IN THE COMMUNICATIONS FIELD" 58962

Address by Commissioner Ray C. Wakefield of the Federal Communications Commission, before the Institute On Women's Professional Relations, Washington, D.C., March 21, 1942.

-0-

Is the war producing a demand for trained women in the communications field? The most dramatic answer to that question is found in wartime Britain today.

The Federal Communications Commission recently sent its Assistant Chief Engineer, Mr. Gerald C. Gross, to survey existing communications in England. Mr. Gross brought back many accounts of striking developments, much testimony concerning the absolute necessity of an efficient communications system to a nation at war, and tales of personal heroism in the communications service. But nothing that he saw or heard impressed me more than his account of the major role now played by women in radio, telephone, telegraph and allied means of communications.

In the telephone industry, for example, women operators were universal. That, of course, was to be expected. But women were also active in the technical jobs. They served as maintenance man, as office supervisors, and, when bombing or other causes made a break in a telephone line, women drove the repair trucks and served on the repair crews.

In radiobroadcasting, the same was true. We have come to expect women in the broadcasting field -- as announcers, as script writers, as program directors, and so on. Those activities, Mr. Gross reports, have vastly expanded in wartime England --but women have not stopped there. You will find women also on the technical side - standing at the controls, serving as assistant engineers, as program monitors, and in a variety of technical and maintenance positions.

The primary purpose of all this feminine activity, of course, is to free the men who formerly performed these duties for service in the uniformed forces. But evidently women's role in British communications has gone beyond even this. When you turn to the uniformed forces themselves, you find women everywhere active in maintaining communications.

We have all read of the WAAFs and the WRENS and the ATS - the Women's Air Auxiliary Force, the Women's Royal Naval Service, and the Auxiliary Territorial Service. These are women's organizations, working right along with the men of the Army, Navy, and Air Force. Now most of the WAAFs are not, of course, flying planes, nor are most of the WRENS and ATS manning ships or guns. What are they doing? A considerable number of them, I am informed, are in the communications service of their respective branches.

Here is an example. There is coming into constantly increasing use a wholly new kind of anti-aircraft device - a sort of secret defensive weapon, if you will. In Britain it is called the radar (r-a-d-a-r); here we call it the radiolocator. It is vastly more efficient than any previous device for

locating enemy aircraft and aiming the anti-aircraft guns which will bring them down. Thousands of skilled technicians are already manning radiolocator installations at key points throughout the British Isles. But "manning" isn't quite the word. For a large proportion of these new radars are not manned at all, but are--as we might say - womaned.

Turning now to the United States, we find that while the process of utilizing women in communications work has not yet progressed that far, we have unquestionably embarked on the same road.

What are some of the factors tending in that direction?

In time of war even more than in time of peace, our telephone, telegraph, and radio systems constitute the nervous system of our whole economy. We need instantaneous communications to carry messages to and from the armed forces on land and sea all around the globe; to coordinate their efforts; to bring news of their needs and movements back to Washington; to keep the wheels of industry moving; and to maintain the morale and productive vigor of workers on the home front. A delay of half an hour in a message may lose a battle; a disruption of communications in any area can lose a campaign. Conversely, with communications operating at high efficiency both at home and overseas, our productive capacity and our military striking power can be utilized with a minimum of obstruction, interference, and delay.

Unfortunately, in time of war the demand for trained communications personnel comes simultaneously and with unabated urgency from two fronts. The normal media of communication - telephone, telegraph, radiotelegraph, and even to a certain extent radiobroadcasting - must operate at even higher efficiency and carry a far heavier message load than in time of peace. And that means more men, or perhaps I should say more men and women. Simultaneously, however, the armed forces have an even more urgent need for the same trained personnel, and, of course, make heavy inroads into the technical staffs of the communications companies.

In the manufacturing field, civilian goods can be curtailed to make available the men, materials, and plant needed for military production. In many other lines of activity the same is true. But in the communications field, a vast increase in specialized military personnel cannot be procured by curtailing civilian activities; for civilian communications are also an essential component of the war effort, and must be expanded simultaneously with the military expansion.

There, briefly, is our need. Let me now particularize that need, industry by industry within the communications field.

The largest single element in modern communications from the point of view of personnel employed in the telephone industry. At the end of 1940, the major telephone companies of the country employed more than 300,000 people, of whom over 60% were women.

The Bell System, comprising the American Telephone and Telegraph Company and its associated companies, is the largest coordinated unit in this field;

indeed, it is the largest private employer and probably the largest employer of women in the country. Some 90% of all telephone employees are in the Bell System. This one group of companies employed at the close of 1940 a total of almost 175,000 women in telephone work.

The bulk of the women in telephone work were either operators or clerical employees. But over and above these semi-skilled or skilled as distinguished from technical and professional women, there was at least a representation of women in the more highly trained telephone occupations.

Of the 577 persons employed in legal capacities by the telephone companies, there is only one woman attorney. I think it fair to conclude from her lonely eminence that legal work in the telephone industry is one of the fields not yet opened up to women.

(Parenthetically I might add that we at the Federal Communications Commission don't maintain quite the same taboo. At the present time we have 8 lawyers who are women, approximately 10% of our legal staff.)

As distinguished from an almost total absence of women in the legal telephone field, it is highly interesting to note that on the technical side, a considerable number of women had broken in even before the present war emergency. Thus at the end of 1940, 26 women were employed as telephone engineers, 244 as draftsmen, surveyors, and student engineers, 4 as supervising foremen, 31 as installation, maintenance and construction "men", and so on. Not large figures on an absolute scale; but they indicate that even before the personnel problems raised by the defense and victory programs, the door was beginning to open for women in technical telephony.

Such was the picture at the end of 1940. What has happened since?

First of all, total employment rose most abruptly during 1941. The Bell System alone increased its payroll during the year by 57,000 persons. But that is only part of the story. Due to losses of personnel through Selective Service, old age, and all the other causes, the Bell System found it necessary to hire during the year 131,000 new people in order to procure that net increase of 57,000 in total employment.

During 1941, 5,700 Bell System employees left the company to enter the armed forces - and of course the anticipated number for 1942 is far larger. The Army Signal Crops alone has recently requested 2,000 technical telephone specialists; and this number also may be only a forerunner of larger requests hereafter.

I don't suppose that it is even today easy for women to get or fill these new technical jobs now opening up in the telephone industry. In the first place, few women have the technical engineering background necessary; and even worse, few have the underlying high school science and technology course upon which special technical or engineering training can be built. Also, the preference for men in technical and professional posts remains strong.

But as the shortage of trained technical personnel becomes more acute, the preference for men is bound to become weaker in technical as in other fields. Even hard-bitten executives who have been heard to say that they'd rather close

up shop than hire a woman for a responsible position, will succomb to the situation when they need an employee with a given technical training - and the only qualified applicant is a woman.

Designing courses in telephoney for women should be a fairly simple task because of the highly centralized nature of the industry. With 90% of all telephone employees working for the Bell System, it is obvious that any training courses in telephony should be closely geared to the needs and anticipated needs of that system - with one eye always fixed, of course, on the probable future needs of the armed forces themselves, in the event that we too find it necessary to employ women auxiliaries to our armed forces on the British pattern.

I would add only one caveat in passing. The success of any new training program such as now seems on the way will depend upon the care with which trainees are chosen. Not every girl has the qualities which make a competent technician - any more than every man has them. A rush of girls and women into communications work who are not specially suited for it will defeat the aims of the program. Fortunately, our colleges and universities have, as you know, developed in recent years increasingly reliable tests for vocational interests and aptitudes. I need only mention the vocational interest tests developed by my friend, Dr. Strong at Stanford University. If training programs now under way or in contemplation are to reach their maximum utility, they should be geared in with our best educational techniques, especially those which have in the past proved their worth in the elimination of wasted educational effort.

Turning now from telephone communications to radiobroadcasting, we find a similar acute need for more trained personnel.

The program side of radiobroadcasting is a field in which women have long been active and in which they have distinguished themselves without any help from emergency labor shortages.

Dorothy Thompson in the field of news comment and the well known women writers and actresses in the field of radio drama are only the headliners of a considerable number of women engaged in the programming field as continuity writers, editors, program monitors, and authorities on special phases of advertising and salesmanship.

As the war effort directly absorbs more and more men, women in this field are bound to take on still more duties, and more openings are sure to arise. But an even more interesting development, it seems to me, is the probable employment of women on the technical side of broadcasting as station operators, technicians, and engineers. Radio in all its phases, because a new industry, has been a young man's industry. It is, therefore, peculiarly subject to drain of personnel by reason of requirements of the Army and Navy and other governmental activities.

The shortage of technical broadcasting personnel is already acute. I have seen estimates that of the 5,500 qualified broadcasting engineers in the United States, 1,000 have already entered the Army or Navy - and that's just a beginning. So serious has the shortage of trained technicians become that the

Commission has had to relax its technical requirements for radio operators, in order to permit stations to employ operators with lesser qualifications.

This order of the Commission has relieved a little of the immediate pressure; it means that for the time being no station is being forced off the air for lack of skilled personnel, although two stations in somewhat isolated areas have shortened their daily time on the air because they could not replace operators called into service. But it is only one step in the solution of the whole problem. The other and more important step is to train new people for the urgent radio needs of the Army, the Navy, and the broadcasting industry.

As far back as August 1941, representatives of the Government, the broadcasting industry, and educational institutions were conferring on that problem, and special training courses for radio technicians were mapped out. The first of these courses, it is believed, was instituted last September at the University of North Carolina. Today this program has expanded so that special radio technician courses are being offered at more than 60 colleges and universities, including a course at Vassar; a total of nearly 32,000 students are enrolled. That figure was only 5,400 on November 30.

These courses vary from some open to anyone with a high school diploma and two years of high school mathematics to courses open only to graduates of engineering schools with broadcast engineering experience. The aim is to turn out, at every level of technical competence, trained people in sufficient quantity to meet our wartime civilian and military needs.

These courses are open to men and women alike. How many women are currently taking advantage of the training offered, I don't profess to know; but I do know that if the wartime experience of England is a safe guide - and I believe it is - we will need women in this work in unprecedented numbers.

Administration of the radio technicians' training program is financed with U.S. Office of Education funds administered by the ESMDT, which stands for Engineering, Science and Management Defense Training. The work is being carried on with the full cooperation of the broadcasting industry, which is supplying trained teachers, equipment, and even classrooms. I think that I can recommend the radio technicians' training program, now proceeding under full steam, as a model for those desiring to establish similar training programs in other fields.

Let me touch briefly in conclusion on openings for women in the remaining branches of communication - telegraph, radiotelegraph, and cable communications. Here, especially in the case of telegraph messengers, we see the forces of wartime labor shortage actually at work in recruiting women for jobs heretofore held by men.

As the general level of employment rose, the telegraph companies found it harder and harder to recruit boys for messenger work. Some of you may recall that for a time every telegram you received had a little folder in it offering jobs as telegraph messengers to likely boys in need of work. All such efforts failed to procure enough messengers; so that recently the telegraph companies have turned, especially in the large cities, to the employment of girls

in this traditionally masculine occupation.

Of course, messenger service is an unskilled occupation which requires little preliminary training at the college level. But I think the example is significant of the forces actually at work around us is opening up new employment fields to women.

Like other types of communication, the telegraph industry is now suffering from the joint impact of two labor shortage-producing trends - a sharp increase in its volume of business coincident with a demand for trained telegraph men for the armed forces.

Certain special factors, however, are present in the telegraph picture which may affect the probability of increased future employment there. In particular, there is the fact that two companies, Western Union and Postal Telegraph, now operate in competition, with a resulting substantial duplication of effort. A bill is now about to be introduced in Congress under which these two companies may be merged into a single telegraph company.

Prior to the defense and victory programs, it appeared likely that total employment in the telegraph industry faced drastic curtailment, especially if, as seemed likely, a merger became effective. Fortunately current facts indicate that a merger can be accomplished at this time without injury to telegraph employees. In this field, we have moved rapidly from a position where the danger was widespread unemployment to one where the danger is labor shortage; but women's place in the picture is not yet clear.

I see that I have already exhausted my time without covering all of the topics which may interest this group. Let me sum it up by saying that the communications industry is among those which will feel the shortage of technically trained personnel first and most acutely. It is an activity which must be maintained at unimpaired efficiency throughout the war. Women have already entered with marked success many communications activities; and if, as seems likely, English experience is a fair basis for prediction, then we must plan now, and extensively, for a large-scale training and employment of women in even the most technical branches of American communications work.

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Excerpts
From INDEPENDENT WOMAN
April 1943

TUNE IN ON RADIO JOBS

by Beatrice Oppenheim

Radio is calling women. Right now the need is for technicians. Women who can pass amateur radio operator's tests are wanted by eight branches of the war services. . . Networks are unlocking doors, hitherto labeled "male only," to women newscasters.

RCA to train co-ed radio technicians--80 to 100 engineering cadettes to study at Purdue University."

With that announcement, one of the world's biggest radio manufacturing companies recently threw open its doors to women, and rolled out the welcome mat.

The RCA doorstep isn't the only one displaying that hospitable sign these days. Communications are so important in this war, that the nation's pool of experienced radio men is by no means sufficient to fill the needs of the armed services and of commercial broadcasting, too.

Women are being invited by the Army, Navy and Civil Aeronautics Administration to take jobs as radio operators, inspectors, repairmen, and instructors. The commercial networks are offering increasingly responsible positions in program production, as well as in the business and technical departments.

Spokesmen for the industry declare that the war has flung open many doors to females, which otherwise would have been unlocked much more slowly--if just as surely.

"Women have shown that no radio job is too big for them," one male executive points out. "Girls hired as clerks and secretaries have in a few years climbed to high places. Their opportunities were steadily expanding before the war, and will go on growing after the peace is signed."

Five years ago, according to Miss Helen Korday, personnel supervisor, only 20 to 25 per cent of the National Broadcasting Company staff was female. Now the proportion has risen to 33-1/3 per cent; and this includes many key positions.

The commercial program manager, for example is Miss Bertha Brainard, who is 5 feet 2 inches tall, and weighs 115 pounds.

On the same network, Margaret Ross Cuthbert, as director of women's activities, has a daily routine likely to range from planning a broadcast about baby's diet to entertaining an ambassador's wife.

At Columbia Broadcasting Company, Helen J. Sioussat, attractive director of talks, finds the complex task of bringing statesmen, motion picture stars, industrialists and scientists before the microphones just tailored to her abilities. Elmer Davis, director of the Office of War Information, calls her his "Columbus," and credits her with inducing him to become a radio commentator. Miss Sioussat describes her seven exciting years of radio experience in a newly published book, "Mikes Don't Bite."

The newest opportunities for feminine radio enthusiasts, however, are on the technical side. George W. Bailey, chairman of the radio section of the U. S. Office of Scientific Research and Development has announced that women who know enough code and theory to pass an amateur radio operator's examination are wanted by eight branches of the war services.

The WAVES are turning radio assignments over to women; and the WAACs are expected to follow a similar policy.

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RADIO AND WOMEN'S RESPONSIBILITY

Speech By

Commissioner Clifford J. Durr of the
Federal Communications Commission, before the
New York Federation of Women's Clubs, Inc.
At the Hotel Astor, New York City,
Friday, October 27, 1944, at 2 PM.

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Being a cautious as well as a peace-loving individual, I would like to make it clear at the start that the title of my remarks, "Radio and Women's Responsibility", was not my original selection. It was suggested by your Mrs. Goodbar in the letter in which she was kind enough to invite me to talk to you. Without thinking too much about it, I agreed. On further reflection, however, it seems the part of discretion to say I am quite aware that women are not today resting quietly in the special little niche St. Paul carved out for them in his epistle to the Corinthians. Moreover, I don't want to make the too common masculine mistake of trying to "pass the buck" to the women in a matter of common responsibility. It was first tried by Adam in connection with the fruit-eating episode and, as I recall, he didn't get by with it.

In matters affecting the people of the entire nation, we cannot logically allocate responsibility between women and men any more than we can between blondes and brunettes, or Notherners and Southerners, or Easterners and Westerners. If women have any special responsibility for the problems of radio broadcasting, it lies not in their sex but in their ability, through organizations such as those represented in your federation, to do something about those problems.

I am not going to talk to you about soap operas, or singing commercials, or the wear and tear on our emotions and nervous systems from the constant and violent stops and goes necessary to shift from the mood of soothing music to the hysterical urgency of the commercial plug, and back again. Nor am I going to talk about the commercial announcers' personal inquiries into our age, the condition or our hair, or whether we have noted any recent change in the flavor of our favorite cigarettes - or even the identification of commercial products with the heroisms and tragedies of the war. These are merely part of the price we pay for the news, discussion of public issues, and some of the excellent musical and variety programs which radio brings us. Personally, I think the price is far higher than it need be, but I am hopeful that listeners' protests, particularly if they come from organizations such as yours, will eventually result in improvement.

Notwithstanding these annoyances, I do not think anyone can reasonably deny that radio broadcasting has already made a great contribution toward lifting the cultural and educational level of the American people. Certainly

we are a better informed people than we would have been had we been forced to rely upon the printed word alone. Moreover, while majority tastes in music may still be a source of despair to the symphony lover, many people, thanks to radio, have heard good music for the first time and have learned to enjoy it.

However, the measure of how well radio broadcasting is serving us should not be a mere balance of its demonstrated virtues against its faults; neither should the measure be a comparison with other media of a less flexible nature, such as the newspaper, the magazine or the movies. In radio, we have the most powerful and effective instrumentality of mass education and enlightenment ever devised by man. It can also be the most effective instrument yet devised for enslaving the human mind, as the Nazis and their satellites have demonstrated. In its potentiality for influencing human thought it is a development as significant to our day as was Gutenberg's printing press to its day.

Five centuries were required for the first crude hand-press to develop into the high-speed printing press of today. A comparable development of radio broadcasting has been compressed into less than a quarter of a century and it is already entering into entirely new phases of development in frequency modulation, television, and facsimile broadcasting.

The only real test of how well radio is serving us is, therefore, a comparison of its actual performance with the job it is capable of doing, and if we apply this test, I am afraid we can only conclude that radio is still a long way from doing the job it is competent to do. There is also reason for concern as to the direction in which it is going - the drift toward concentration of control and the domination of programming by commercial advertisers. Radio will never become the vital instrumentality of public service it should be unless its listeners are fully aware of its potentialities and are constant and articulate in demanding that they be realized. This is your --or I should say our-- common responsibility.

At no period in history has all wisdom, talent, or genius resided in one man or one small group of men. The richness of our heritage from any past generation has depended not solely upon the genius of the men of that generation but upon their success in crashing through the barriers between them and widespread public access to the fruits of their thinking.

In this country, we have sought to insure wide access to our radio channels through multiplicity in the control of the radio outlets. Though title to the radio channels is reserved in the people, we have feared that concentration and political domination would result from government operation. We have successfully avoided concentration of power over broadcasting in the hands of government. Protection against government censorship is afforded by the guarantee of freedom of speech contained in the First Amendment to our Constitution, and this guarantee has been implemented by express statutory language contained in the Act creating the FCC. Because of some rather loose statements that have been made about FCC's control over what shall or

shall not go out over the air, it might be well to read you the language of the Act:

> "Nothing in this Act shall be understood or construed to give the Commission the power of censorship over the radio communications or signals transmitted by any radio station, and no regulation or condition shall be promulgated or fixed by the Commission which shall interfere with the right of free speech by means of radio communication."

The courts of the land are open in the event FCC should ever attempt to violate this clearly worded statutory prohibition.

And, by the way, the further charge is being made that the FCC uses its licensing power to terrify broadcasters into doing the bidding of the New Deal Administration. I shall digress, therefore, for a few statistics. I cannot tell you how many broadcasters are Democrats or Republicans or Socialists or Prohibitionists. The FCC does not inquire into the political affiliation of its licensees and they are not supposed to use their stations to serve their own political ends or those of their party. However, newspapers have no reason to be reticent in expressing their political opinion in their own columns, and they are not. Many of these newspapers are also affiliated with radio stations. A recent poll by Editor and Publisher shows that of the newspapers which have taken sides in the election, 208 have radio station affiliations, and of these 208:

56 or 27 per cent are for Roosevelt, and

152 or 73 per cent are for Dewey.

As a terrifying hobgoblin, the FCC seems hardly in a class with Gus the Ghost.

Just as we have successfully avoided monopolization of broadcasting by the government, so we have sought to avoid private monopolization by entrusting the use of these channels largely to private individuals or groups who are licensed to operate them in the public interest. There are today about 916 standard broadcasting stations on the air. We have achieved a wide diversification in the ownership of these broadcasting stations and it would therefore seem that we are well on our way to the widest possible access to the air I am sure most of us want. But, unfortunately, diversification in ownership does not necessarily mean diversification in control.

About 660 of the 916 standard broadcast stations are affiliated with one or more of the four national networks, and about half of their total broadcasting time is devoted to national network programs. Moreover, a network contract is a most valuable economic asset and many stations could not survive, much less prosper, without network affiliation. The economic power of the four national networks over the American system of broadcasting may be potentially as effective as control through actual ownership.

But the networks themselves are not entirely free agents. Last year, over 97 per cent of their advertising business came from 144 advertisers and nearly three-fourths of this business was concentrated in four types of business.

Beyond the advertisers, we find still further concentration in the hands of a few large advertising agencies. Not only do these agencies have a tremendous power in the channeling of advertising business, but they have also become probably our largest producers of radio programs.

Except for thirty-odd non-profit stations, the operators of our broadcasting stations are in business to make money, as are the networks, advertisers, and advertising agencies. There is much to be said for this motivation. Their business interests are our best assurance that they will try to provide programs which will please the greatest number of people and offend the fewest. It is for this reason I am hopeful that listener protests will eventually save us from some of the annoyances which have been mentioned earlier.

But may not this very desire to please and unwillingness to offend also prove to be the greatest restraint on the fullest development of the possibilities of broadcasting as an instrument of real public service? I am not referring solely to the neglect of minority tastes in the realm of music, drama and other forms of entertainment. The problem is far more serious in the realm of ideas, for nothing is more offensive than ideas when they happen to run counter to our own particular interests or accepted views.

Unfortunately, most of us like to live in our own Happy Valley, like the sons and daughters of Abyssinia described by Dr. Johnson in his History of Rasselas:

> "To heighten their opinion of their own felicity, they were daily entertained with songs, the subject of which was the Happy Valley. Their appetites were excited by frequent enumerations of different enjoyments; and revelry and merriment was the business of every hour, from the dawn of morning to the close of even.
>
> "These methods were generally successful. Few of the princes had ever wished to enlarge their bounds, but passed their lives in full conviction that they had all within their reach that art or nature could bestow, and pitied those whom fate had excluded from this seat of tranquillity, as the sport of chance and the slaves of misery.
>
> "Thus they rose in the morning and lay down at night, pleased with each other and with themselves,....."

Ideas provoke controversy, and controversy is unpleasant. Moreover, it may well drive away prospective purchasers of advertised products, as well as offend the advertiser who pays the bill. Many of you may recall Alexander

Woollcott's brief venture in radio as the "Twon Crier", on a program sponsored by a breakfast food manufacturer. Woollcott's letters have recently been published and one of them explains the briefness of his radio career. He was advised by his sponsor's advertising agency: "The *** corporation is unwilling to continue the broadcasts after December 29th unless you will agree to refrain from including in your broadcast material of a controversial nature which, in our opinion would be offensive to individuals or groups in the radio audience".

Mr. Woollcott was unwilling to accept that limitation. He informed the advertising agency:

> "I have overheard enough of the experiences of other broadcasters to suspect that it would be difficult to find anywhere among the big national advertisers a sponsor who would be as considerate, liberal and agreeable as the * * * /present sponsor/ has been throughout all our dealings. This would seem to indicate that the Town Crier is unlikely to find any other sponsor willing to meet the terms he must insist on so long as he uses the now established formula which inevitably represents him as one citizen leaning over the fence and talking freely to his neighbors. And since all the good time on the great networks has been preempted by advertisers, that in turn would mean I must drop out of national broadcasting altogether, which, as you know, would be a solution entirely acceptable to me, I would merely be driven back to the comparative privacy of the printed page where, in my own opinion, I belong and where, at long last, I might get some writing done."

The particular issue which arose between Mr. Woollcott and his sponsor had to do with "caustic references" which he made from time to time on his broadcasts with respect to certain prominent persons. The year was 1935, and perhaps, it did not then seem too important whether a radio announcer could or could not make unkind remarks about the individuals in question. Today we can more fully appreciate the significance of the letter to Mr. Woollcott informing him that his sponsors "preferred that you didn't make any more caustic references to people like Hitler and Mussolini as there are large racial groups who are apt to be antagonized by these references."

Six continents are now involved in war because of ideas which were started by a privileged caste of professional militarists and spread into the twisted mind of a down-and-out nobody with a genius for stirring the masses by appealing to their lowest emotions. If these ideas had been fought early enough with opposing ideas, it might not have been necessary to fight them with arms and to pay the resulting cost of destruction and death.

It would be dangerous to delude ourselves with the thought that ideas such as these are foreign and could therefore never grow in our own soil. Unfortunately, we still see some of their manifestations right here at home

(OVER)

and they can thrive here, too, unless other ideas are left free to fight them.

The basic principles enunciated in the Declaration of Independence and the Bill of Rights are, unfortunately, still controversial subjects. We pay reverend tribute to these documents and assert that our only disagreement is about their interpretation, but too often disagreements of interpretation are based upon lack of acceptance of basic principles. Perhaps the declaration that all men are created equal and endowed with the inalienable rights of life, liberty, and the pursuit of happiness was not intended as a factual description of conditions existing anywhere at the time of the Declaration or at any other time in history; but as a statement of objectives to be fought for, it was a challenge big enough to produce a new nation. If we are to continue the pursuit of those objectives, the principles on which this nation was founded must be restated over and over again --in song and dramatization as well as in set speeches; and we must be willing to offend, if necessary, in stating them. We accomplish little by the frank discussion of the Nisei problem in Tennessee or the Negro problem in Vermont or the problem of religious intolerance in communities isolated from religious conflict.

You may well ask, How is this our responsibility? What can we do about it? The answer is that each of you alone cannot do very much, but you and others like you can do a lot. There are courageous and public-minded broadcasters who see these problems and want to do something about them. You can support and encourage them when they dare to offend. You can insist that the more timorous or more commercial-minded broadcasters make time available for the frank discussion of issues that are vital to us all. You can insist that the men and women in programing departments of our national networks, who have demonstrated what they can and want to do in such programs as the Bill of Rights broadcast and the Open Letter, are not to be disheartened by seeing their programs rejected by local stations in favor of commercial programs. And you can insist that the decision as to what we shall or shall not hear at the times when most of us are at home to listen shall not pass into the hands of a few advertising agencies whose sole function is to sell the goods of their customers.

Radio will achieve its destiny only when you and many more like you become conscious of its possibilities and raise your voices in insistence that these possibilities are fulfilled.

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EVENING SUN
Baltimore, Md., Nov. 5, 1942.

NRL copy

Nat'l Research Council

WAR RADIO JOBS OPEN TO GIRLS IN 8 FIELDS

WASHINGTON, Nov. 5 - Women are in demand for radio jobs in eight different branches of the war services, a survey by George W. Bailey, chairman of the radio section, Office of Scientific Research and Development, has revealed. The jobs, open to women who know enough code and theory to pass amateur radio operator's examination are:

1. As junior aircraft communicators by the Civil Aeronautics Administration. The CAA offers a six-month course of instruction for this work. Pay during the trainin course is $1,440 a year, with an advance at the end of training to $1,620. Applications are handled by civil service.

In Army Air Forces

2. In the Army Air Forces, as instructors. Student instructors can make $1,620 and experienced radio women can get $2,000 at four schools--Scott Field, Illinois; Chi Chicago; Sioux Falls, S.D. and Madison, Wisc. Civil Service also handles applications for this branch.

3. The Signal Corps general development laboratory, at Fort Monmouth, N.J. which is taking women from 16 to 50 years old. A six-month training course is offered, during which students are paid $120 a month, with employment at the end of the course at $135. Applications are handled by Lieut. John T. Freeman, General Development Laboratory, Signal Corps, Fort Monmouth, Red Bank, N.J.

4. The Navy radio section, Bureau of Ships, on application to Lieut. L.B. Wheeler, Room 2N 21, Navy Dept.

5. The Naval ordnance laboratory under Ralph Cautley.

6. The radiation laboratory, Massachusetts Institute of Technology, Cambridge, Mass. under Dr. F. W. Loomis.

7. The Naval research laboratory, Anacostia, D.C. under Fred A. Pierce.

8. The WAVES and WAACs.

Must Know Code

Although women desiring radio positions must first learn the radio code, jobs as code operators just do not exist for women, Mr. Bailey said. The armed services uses teletypes entirely for most radio communication. Code is tapped out only in the front lines, where women are not sent.

It is necessary to learn code, however, in order to obtain an amateur license, and this license is a stepping stone to most radio jobs.

To prepare for the license examination, you can go to a commercial or Govt. sponsored radio school, take a correspondence course froma commercial school or study at home.

Women

Total 985

ASSOCIATION OF WOMEN DIRECTORS OF THE NATIONAL ASSOCIATION OF BROADCASTERS
COORDINATOR OF LISTENER ACTIVITY, DOROTHY LEWIS, ROOM 902, 535 FIFTH AVE.

.....

#355

DISTRICT 1. CONNECTICUT, MAINE, MASSACHUSETTS, NEW HAMPSHIRE, RHODE ISLAND, VERMONT

.....

CONN.	WTHT	Hartford	Eunice Greenwood	Jane Conners	
			Una King		
	WTIC	Hartford	Gena Canestrari	Inez Hansen	Ida Burbank
			Grace Sapsuzian	Gretchen Thomas	
	WSTC	Stamford	Nell Daugherty	Norma Moray	
			Kay McEwen		
	WATR	Waterbury	Jeanne Ardin Strongin	Jeanne Greenblatt	
			Miriam Hurlburt	Betsy McLean	
	WBRY	Waterbury	Fay Clark		
MASS.	WNAC	Boston	Louise Morgan	Phyllis Doherty	Winifred Pike
			Martha Johnson	Yvonne Berge	Connie Stackpole
	WCOP	Boston	Mildred Bailey	Connie Ford	
				Kay Harrison	
	WEEI	Boston	Caroline Cabot	Priscilla Fortescue	
			Heloise Broeg	Evelyn Howe	Marie Houlahan
	WMEX	Boston	Marie Mason	Mrs. Rebekah Higginson	
	WSAR	Fall River	Josephine Welch		
	WEIM	Fitchburg	Kay Collins	Dorothy McKittrick	
	WHAI	Greenfield	Irmarie Scheuneman	Arlene Wood	
	WHYN	Holyoke	Helen Hope	Mary Montague	
	WNBH	New Bedford	Evelyn Melle		
	WBRK	Pittsfield	Mary E. Esmond	Gene Domby	Lovelma Outcalt
	WMAS	Springfield	Mae Brown		
	WSPR	Springfield	Lorraine Guertin	Mrs. Donald Kibbe	
			Flora Smith	Faye Winniman	
	WTAG	Worcester	Julia Chase		
N.H.	WKNE	Keene	Ruth Redington	Esther Linder	
	WLNH	Laconia	Marie Forsberg		
	WFFA	Manchester	Janet Carr	Adeline Casseboom	
	WMUR	Manchester	Julie Blake		
	WHEB	Portsmouth	Lee Spencer		
R.I.	WFCI	Pawtucket	Betty Gunning		
	WJAR	Providence	Mrs. Howard Wood		
	WPRO	Providence	Elizabeth Frazier	~~Jane McManus~~ 12/13	
VT.	WCAX	Burlington	Ethel A. Starbird	Edith VanBuren	Eleanor Prince
			Margaret Burnet		
	WSYB	Rutland	Beth Davis		
MAINE	WCSH	Portland	Margaret Smith		
	WGAN	Portland	Dorothy Smith Wadman		
	WCOU	Lewiston	Roselle Coury		

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DISTRICT 2. NEW YORK, NEW JERSEY

N.Y.	WABY	Albany	Cathy Rice	Kay Feily	
	WNBF	Binghamton	Dorothy Baher	Helen Bogosta	Sara Burbank
			Dorothy Titchener		
	WLIB	Brooklyn	Estelle Sternberger		
	WBEN	Buffalo	Mrs. Margaret Wilkinson	Esther Huff	Dorothy Kaszubiak
	WEBR	Buffalo	Janet Lovelace	Dorothy Shank	
	WGR	Buffalo	Lillian Kirk	Helen Neville	
	WENY	Elmira	Betty Stevens	Lois Hammond	
	WHCU	Ithaca	Gertrude Grover		
	WJTN	Jamestown	Dorothy Hanson	Catherine Lindstrom	Lucille Soderstrom
			Lucille Winkie		
	WALL	Middletown	Gale Gray		
	WEAF	New York	Adelaide Hawley	Lois Day	Estella Karn
			Virginia Stewart	Maggi McNellis	Mary Margaret McBride
	WINS	New York	Dorothy Day	Hazel Cullum	Gertrude Friedlander
			Hazel Estes	Muriel Kalish	
	WJZ	New York	Grace M. Johnsen	Nancy Craig	Pegeen Fitzgerald
			Alma Kitchell	Gertrude Hoffman	Jean Colbert
			Ruth Crawford		
	WNEW	New York	Paula Stone		
	WQXR	New York	Charlotte Adams	Iphigene Bettman	Alma Dettinger
			Eleanor Sanger	Dorothy Gordon	Alice Pentlarge
			Eleanore (Pat) Hurley		
	WOR	New York	Martha Deane	Bessie Beatty	Josephine McCarthy
			Elsie Dick	Dorothy Kilgallen	Lucille Martin
			Edyth Meserand	Lorraine Sherwood	Ilka Chase
			Elsa Maxwell	Dorothy Kemble	Dorothy Baxter
	CBS	New York	Lucille Singleton	Nila Mack	Agnes Law
			Mildred Game	Elinor Inman	Katherine Revner
			Ella Howard	Dorothy Leffler	Margaret O'Connor
			Isabel Goldthwaite	Margaret Arlen	Esther Dobbins
			Rosemarie Riley	Dorothy Boyle	Dorothy Mitchell
			Kate Smith	Mae Clark	Ruth Moody
			Helen Sioussat	Frances Buss	Ann Harding
			Helen Brattrud	Frances Farmer Wilder	May Dowell
	NBC	New York	Anita L. Barnard	Doris Corwith	Grace Sniffin
			Alberta Hackett	Elizabeth Scott	Jane Tiffany Wagner
			Georgia Fuller	Marion Noyes	Miriam Hoffmeir
			Irene Kuhn	Marie Dolan	Helen Kellie
			Doris Ann	Margaret O'Connor	Helen Korday
			Helen Moore	~~Alice Chapman~~ 8/20/41	Priscilla Campbell
			Helen Leaf	Amelia Underwood	Frances Sprague
			Mildred Joy	Margaret Cuthbert	
	NAB	New York	Dorothy Lewis - 535 Fifth Avenue		
	WSLB	Ogdensburg	Flo Beach Rowe	Alice Andrews	Claire Burns
			Shirley Walsh		
	WMFF	Plattsburg	Betty Kraus		
	WHAM	Rochester	Inez Quinn	Louise Wilson	Betty Bocklage
			Josephine Szinkunas		
	WHEC	Rochester	Madeline L. Cleary		
	WGY	Schenectady	Elizabeth Paling	Irma Lemke Kroman	
	WSYR	Syracuse	Ione McNay		
	WHAZ	Troy	Kathleen Moser		
	WTRY	Troy	Mary Elizabeth Gaynor		
	WIBX	Utica	Margaret Bowen	Gladys Moore	Betty C. Griffin
			Elizabeth Odames		
	WWNY	Watertown	Gwen B. Scanlin	Mary Cavallies	Doris C. Knowlton

CBS NY City Miss Isabel Leighton

DISTRICT 2 (CONTINUED)

N.J.	WCAP	Asbury Park	Vera Scholes	Min C. Feldman	Doris Johanson
	WHOM	Jersey City	Josephine McQuillan		
	WAAT	Newark	Nan Lupo	Janie Grady	
	WTNJ	Trenton	Marion Marshall		
	WTTM	Trenton	Marie Maxwell	Dean Andrews	Georgiana Landry
	WAWZ	Zarephath	Kathleen White	~~Helen Smith~~ 9/4/46	

DISTRICT 3. DELAWARE, PENNSYLVANIA

PA.	WSAN	Allentown	Olivia P. Musselmann		
	WISR	Butler	Gladys Borne	Jessie Stocking	Ephe Parker
	WCED	Du Bois	Virginia Wade Ryder		
	WKBO	Harrisburg	Kaye Witmer		
	WHP	Harrisburg	Beatrice Potteiger		
	WJAC	Johnstown	Evelyn Simmons		
	WGAL	Lancaster	Gladys Furry		
	WDAS	Philadelphia	Polly Whitaker		
	WFIL	Philadelphia	Jessie Young	Anice Ives	Mary Biddle
	WHAT	Philadelphia	Miss D. Banks		
	WIP	Philadelphia	~~Frances McGuire~~ 12/13		
	KQV	Pittsburgh	Alicia Fuller	Jane Gibson	Corell T. Mara
			Marjorie Davis	Florence Sando	
	WWSW	Pittsburgh	Marie Wilke		
	WMBS	Uniontown	Elinor Johnson		
	WJPA	Washington	Patty Phillips	Gladys Fox	
	WBRE	Wilkes-Barre	Geraldine Foster		
	WSBA	York	Mary Nell Kling	Anetta Hain	
DEL.	WILM	Wilmington	Mary Frances Hill		

DISTRICT 4. DISTRICT OF COLUMBIA, MARYLAND, N. CAROLINA, S. CAROLINA
VIRGINIA, W. VIRGINIA

D.C.	WMAL	Washington	Ruth Crane			
	WTOP	Washington	Elinor Lee	Hazel Kenyon Markel		
	WOL	Washington	Marion Sexton	~~Florence Marner~~	~~Marshall Adams~~	8/20/46
	WWDC	Washington	~~Lucy Elliott~~ 12/13	Esther VanWaggener Tufty		
	WRC	Washington	Nancy Osgood			
	WINX	Washington	Betti Allen	Pat Griffith		
	NAB	Washington	Lee Hart - 1760 N. St. N.W.			
MD.	WCBM	Baltimore	Helen Hall			
	WBAL	Baltimore	Dorothy Cotton	Mollie Martin		
	WFMD	Frederick	Roenna Fahrney			
N.C.	WWNC	Asheville	Pricilla Parker			
	WISE	Asheville	Floye Bowers			
	WBBB	Burlington	Carol Winter			
	WBT	Charlotte	Mona Paine			
	WAYS	Charlotte	Estelle Cuddy			
	WSCC	Charlotte	Margaret T. Walker			
	WDNC	Durham	Doris Woods Bromaze			
	WFNC	Fayetteville	Mrs. Herman Pohl			
	WBIG	Greensboro	Bess Rosa	Margaret Cox		
	WGTC	Greenville	Mary Rakes	Margaret Richardson		
	WHIT	New Bern	Jacquline Melton	Virginia Bennett		
	WPTF	Raleigh	Harriet Pressley			
	WAIR	Winston-Salem	Doris Pardington	Marvel Campbell	Doris Brown	
	WSJS	Winston-Salem	Elizabeth Trotman	Isabel Shaffer	Mrs.Pauline Alspaugh	
	WMFD	Wilmington	Martha Ann Allen	J.M. Johnson		
	WGTM	Wilson	Lela Watson			
S.C.	WAIM	Anderson	Virginia Mauldin			
	WTMA	Charleston	Alicia Rhett			
	WCSC	Charleston	Gladys Sage			
	WIS	Columbia	Christie Zimmerman	Louise Lang		
	WOLS	Florence	N.L. Royster			
	WORD	Spartanburg	Josephine McWhorter			
	WSPA	Spartanburg	Jane Dalton	Annette Ducheim	Mary E. Phifer	
	WFIG	Sumter	Alison K. Semino	Dorothy Boney		
VA.	WBTM	Danville	Jacqueline Jones			
	WSVA	Harrisonburg	Jane Wyndham			
	WLVA	Lynchburg	Caroline G. Read	Terry Teal	Jane Creacy	
	WMVA	Martinsville	Barbara Harding			
	WTAR	Norfolk	Shirley Enright			
	WGH	Newport News	Phyllis Leon			
	WRNL	Richmond	Polly Daffron			
WSLS	~~WSLS~~	Roanoke	Virginia S. Krebs	Kay Lee		
	WDBJ	Roanoke	Virginia Eure			
W.VA.	WGKV	Charleston	Ann Davis			
	WCHS	Charleston	Melva G. Chernoff	Elizabeth Camp		
	WJLS	~~Berkley~~	Midge Lee			
WBLK	~~WBLK~~	Clarksburg	Jane B. Matthews			
	WSAZ	Huntington	Irene Bruce	Pat Wilson		
	WLOG	Logan	Dorothy Thornbury Armstrong			
	WPAR	Parkersburg	Paula Carr			
	WWVA	Wheeling	Ruth Lee Miller	Joanna Green		
	WKWK	Wheeling	Evelyn Haden			

Beckley

DISTRICT 5. ALABAMA, FLORIDA, GEORGIA, PUERTO RICO

ALA.	WAPI	Birmingham	Delmar Bradley	Marjorie Dennis	Levise Hollowan
	WBRC	Birmingham	~~Margaret Cotton~~ 12/13		
	WSGN	Birmingham	~~Evelyn Hicks~~	Frances Henry	
	WMFT	Florence	Deborah B. Cotton		
	WMOB	Mobile	Eleanor Whitelaw	Adele Hull	
	WCOV	Montgomery	Dorothea Askins		
	WJHO	Opelika	Anne Davis		
	W				
FLA.	WFTL	Ft. Lauderdale	Margaret E. Duane	Jane Butler	
	WRUF	Gainesville	Mrs. Garland Powell	Marion Morris	Elizabeth Tew
	WJHP	Jacksonville	Alice Withee		
	WMBR	Jacksonville	~~Ann Lee Stagg~~	~~Nadine Williams~~ 12/13	
	WPDQ	Jacksonville	Anne Daily	Dorothy Horsfall	
	WQAM	Miami	Hazel McGuire	Laura Eggleston	
	WDBO	Orlando	Myrtle Louise Carry		
	WCOA	Pensacola	Margaret Dunaway	Bill Round added 9/6/46	
	WFOY	St. Augustine	Ann Bernice Nachtman	Frankie Collyer	
	WSUN	St. Petersburg	Beth Porter McNeely		
	WTSP	St. Petersburg	Barbara San		
	WDAE	Tampa	Kay Hargrove Dowst		
	WFLA	Tampa	Patsy Kent		
	WJNO	W.Palm Beach	Kathleen Low		
GA.	WGPC	Albany	Virginia Erwin	Mildred Huie	Margaret Kinnett
			Annette Smith		
	WAGA	Atlanta	Jane Burrows	Clover Gatling	
	WATL	Atlanta	Para Lee Brock		
	WGAC	Augusta	Theodora Morgan		
	WGAA	Cedartown	Rowena Whitfield	Jean Brooks	
	WRBL	Columbus	~~Gertrude Handley~~ 12/13	Alice Wismer	
	WBLJ	Dalton	Mrs. Walter Stancil		
	WGGA	Gainesville	Nancy Thompson		
	WBML	Macon	Peggy Halliburton		
	WMAZ	Macon	Dorothy Small		
	WRGA	Rome	Katherine Alford		
	WSAV	Savannah	Alberta Robertson	Ruth Christianson	Electa Hoffman
	WRLC	Toccoa	Billie Garnick		
PUERTO RICO	WKAQ	San Juan	Sofia Rodriquez	Mrs. Alice Brown	
	WIAC	San Juan	Olga Lugo	Mrs. Andreita G. de Martin	

DISTRICT 6. ARKANSAS, LOUISIANA, MISSISSIPPI, TENNESSEE

ARK.	KFPW	Fort Smith	Dorothy Gibson	Florence Floyd	Alma Duncan
	KTHS	Hot Springs	Hazel Jacobs Kownig		
	KBTM	Jonesboro	Veda Beard	Beauton Wood	
	KARK	Little Rock	Lillian Goldman		
	KLRA	Little Rock	Mina Madden		
	KUOA	Siloam Springs	Gilberta Walton	Mary Shaw	Margaret Morris
			Helen Wilson		
LA.	WJBO	Baton Rouge	Hope Halpin		
	WDSU	New Orleans	Jeanne Spoonamore	Shirley Kilgore	Marjorie Freels
	WSMB	New Orleans	Ruth Russell		
	WWL	New Orleans	Alice Robert	Mrs. Clark Salmon	Jill Jackson
			Virginia Freret	Suzanne Javeau	Margaret Ashley
	KRMD	Shreveport	Elizabeth Alford	Jane Reed	Eleanor Wagner
	KWRH	Shreveport	Elizabeth Selassi	Marie Battie	Erwina Anthony
MISS.	WCBI	Columbus	Yvonne Brisbane		
	WJPR	Greenville	Sally Kellner	Rosemary Mock	
	WFOR	Hattiesburg	Betty Baker		
	WAML	Laurel	Jeanette Burmeister		
TENN.	WDOD	Chattanooga	Juanita Walter Kemp	Carolyn N. Sawyer	Sue Johnson
			Mabel Connor Light		
	WTJS	Jackson	Mrs. Claude Merwin		
	WJHL	Johnson City	Anna Sue Lacey	Alice Friberg	
	WKPT	Kingsport	Ellen King		
	WBIR	Knoxville	Pan Wittemore	Arlene Irwin	Catherine Brown
			Emily Buchanan		
	WMC	Memphis	Olivia Brown		
	WLAC	Nashville	Kay Stevens		
	WSM	Nashville	Marjorie Cooney		

DISTRICT 7. KENTUCKY, OHIO

KY	WCMI	Ashland	Blanche Seay		
	WLBJ	Bowling Green	Mrs. Helen Given	Miss Juanita Britt	
	WSON	Henderson	Martha J. Reed		
	WGRC	Louisville	Frances Sams		
	WGRO	Louisville	Sharon Kane		
	WHAS	Louisville	Lu Murphy	Ann Hubert	Kay Hopson
			Grace Dorcas Ruthenberg	Ethel Smith	Bunch Sanders
	WAVE	Louisville	Mrs. G.W. Norton, Jr.	Mary Rhodes	Natalie Potter
			Mary Jane Jesse		
	WINN	Louisville	Mrs. Louise Weiller	Mrs. D. E. Kendrick	
			Mrs. Gertrude Hardeman		Miss M.K. McCarten
	WPAD	Paducah	Evelyn Carroll		
OHIO	WAKR	Akron	Viola G. Berk	Ann Parker	Marcy Deleone
	WHBC	Canton	~~Janet Baker~~	~~Elizabeth Weeks~~	~~Patricia Strombach~~ resigned 8/9/46
			~~Carol Adams~~	Zetta Horst	~~Persis Thomas~~
			~~Kathleen Carter~~	~~Dorothy Reiss~~	Dir - Wm's Activities
	WCKY	Cincinnati	Olive Kackley		
	WKRC	Cincinnati	Helen Nugent	Penny Pruden	
			Frances Swing Van Veen		
	WLW	Cincinnati	Ruth Lyons	Katherine Fox	Rhea McCarty
	WHK	Cleveland	Eleanor Hanson		
	WGAR	Cleveland	Esther Mullin		
	WJW	Cleveland	~~Robin Tuscadero~~ 8/20/46	Dorothy Fuldheim	Jane Shirley
	WTAM	Cleveland	Mildred Funnell		
	WHKC	Columbus	Marie Hornbeck	Rita Thomas	Edna Moreland
	WBNS	Columbus	Fern Sharp	Betty Newton	
	WCOL	Columbus	~~Kay Keltner~~ 12/13		
	WOSU	Columbus	Miriam Foltz		
	WHIO	Dayton	Dorothy Allsup	Adele Unverferth	
	WFIN	Findley	Milicent Mertz	Pauline H. Rahal	Joanne Lewis
	WLOK	Lima	Catherine Goeke		
	WMRN	Marion	Madge Cooper	Ethel Fay Locker	Colleen Rippey
			Mrs. Margaret McPherson		
	WPAY	Portsmouth	Lucile Graham	Uldene Dutiel	
	WSPD	Toledo	Mrs. Norma Richards	Ginney Wood	
	WTOL	Toledo	~~Catherine Goeke~~	~~Libby Nite~~	~~Betsy Rosen~~
	WRRN	Warren	Mary Kay O'Connor	Jean Loney	Jean L. Krieger 11/21/46
	WFMJ	Youngstown	Marion Resch	Kathryn Leskosky Beeteman	
	WHIZ	Zanesville	Marjorie A. Weber		

Marjorie Wells, Woman's Director

DISTRICT 8. INDIANA, MICHIGAN (EXCLUDING COUNTIES OF ONTONAGON AND GOEBIC)

IND.	WTRC	Elkhart	Ethel Saiss	Mary Thompson
			Mrs. A. Marsden	
	WEOA	Evansville	~~Pat Roper~~	~~Margaret Rosencranz~~
	WGBF	Evansville	Pat Roper	Margaret Rosencranz
	WFBM	Indianapolis	Mrs. J.R. Farrell	Alice Abbot
	WIBC	Indianapolis	Jane Day	
	WISH	Indianapolis	Dorothy Braun	Frieda Robinson
			Catherine Snodgrass	Catherine Daniels
	WIRE	Indianapolis	Jane Allison	
	WKMO	Kokomo	Marian Ellis	Ann Ginn
	WGRC	New Albany	Charlotte Falkner	
	WBOW	Terre Haute	Madeline Barry	
MICH.	WJR	Detroit	Geraldine Elliott	Mrs. Page.
	WKZO	Kalamazoo	Frances Badley	Ann McMillan
			Susan Ann James	
	WKBZ	Muskegon	Elsie Buttrick	Adeline Loko
	WHLS	Port Huron	Helen Nelson	Anna B. Coushaine
	WELL	Battle Creek	Mildred Grace	
	WSOO	Sault Ste. Marie	Mrs. Vera Holton	Mrs. Ann Pratt

DISTRICT 9. ILLINOIS, WISCONSIN (Wisconsin also in District 11)

ILL.	WDWS	Champaign	Juanita Hall	Mrs. C. C. Wiley	
			Catherine Scheurich	Sally Ann Savage	
	WAIT	Chicago	Judy Logan		
	WBEZ	Chicago	Elizabeth E. Marshall		
	WENR	Chicago	Frances Dixon	Beulah Karney	
	WJJD	Chicago	June Merrill	Margaret Leak	
	WLS	Chicago	Martha Crane	Helen Joyce	Josephine Wetzler
	WMAQ	Chicago	Elizabeth Hart	Judith C. Waller	
	WMBI	Chicago	Frances Youngren	Joyce Blackburn	
	WHFC	Cicero	Marie E. Clifford	Florence J. Summers	
	WDAN	Danville	Hornore Ronan	Joan Randolph	
			Kay Moore	Mary Kane	
	WSOY	Decatur	Mary Jane Prather	Jane Waddell	
	WEBQ	Harrisburg	Wanda R. Owen	Mrs. Fred Lindsay	
	WMBD	Peoria	Mary Linda Grimm		
	WTAD	Quincy	Mildred Verheyen	Zoula Gatewood	Jean Fessler
			Jean Verheyen	Catherine Roland	
	WROK	Rockford	Olga Johannes	Florence Shugars	
	WHBF	Rock Island	Millicent Polley	Fern Hawks	
	WCBS	Springfield	Mary L. Dilley		
	WDZ	Tuscola	~~Adelaide Ayers~~ 12/13		

WIS.	WHBY	Appleton	Helen Day	
	KFIZ	Fond-du-Lac	Lucille Fairbanks	
	WKBH	LaCrosse	Cora Hauser	Bernice Callaway
	WIBA	Madison	Peggy Bolger	Marvel Ings
	WOMT	Manitowoc	Donna Wodak	
	WISN	Milwaukee	Mary Ann LeMay	
	WTMJ	Milwaukee	Nancy Grey	
	WRJN	Racine	Helen Griffith	
	WHBL	Sheboygan	Marion Heiden	Doris Domnie
	WFHR	Wisconsin Rapids	Lee Semones	Betsy Simon

DISTRICT 10. IOWA, MISSOURI, NEBRASKA

IOWA	KBUR	Burlington	Lucille Weinrich	Ellyn McDermott	
	WMT	Cedar Rapids	Pearl Broxam	Wilma Adams	Fay Magee
	KROS	Clinton	Lucille DeLeers	Darlene Gordon	
	WOC	Davenport	Mary Louise Marshall	Jane S. Bloom	
	KRNT	Des Moines	Betty Wells	Wynn Hubler	Helen Makus
	WHO	Des Moines	Ruth Burton	Lucille H. Bryson	
	KDTH	Dubuque	Shirley Silvers	Esther Martin	
	WKBB	Dubuque	Jeanne Wiedner		
	KVFD	Fort Dodge	~~Arlene Armstrong~~ 12/13		
	KPJB	Marshalltown	Thelma LeValley	Arlene Gard	
	KGLO	Mason City	Charlotte Visser	Dominie V. Haynes	
	KFNF	Shenandoah	Marion M. Stubbs	Shirley Cox Barkman	
	KMA	Shenandoah	Leanna Driftmier	Edith Hansen	Doris Murphy
	KSCJ	Sioux City	Elizabeth Sammons		
	KTRI	Sioux City	Mary Louise Sheer	Rita Tepf	Mary Dillon
	KICD	Spencer	Zelda J. Anderson		
	KXEL	Waterloo	Irene DuMond		
MO.	KFVS	Cape Girardeau	Virginia Bahn		
	KFRU	Columbia	Dorothy Jacques		
	KHMO	Hannibal	Maxine Dierking		
	KCMO	Kansas City	Anne Hayes		
	KMBC	Kansas City	Caroline Ellis	~~June Martin~~ 12/13	Mildred Whiting
			Dorothy Maloney	Thelma Rosenbalm	
	WDAF	Kansas City	Dorothy Crew		
	WHB	Kansas City	Jetta Carleton	Martha Logan	Sandra Lee
	KWOC	Poplar Bluff	Helen Peterson		
	KSD	St. Louis	Peggy Cave		
	KXOK	St. Louis	Kay Morton		
	KGBX	Springfield	Jerry Fusco		
	KWTO	Springfield	Dorothy Martin		
NEB.	KMMJ	Grand Island	Jane Anderson		
	KGFW	Kearney	Peg Biber	Norma Applegate	
	WJAG	Norfolk	Mary Moore		
	KGNF	N. Platte	Mrs. V.G. LeBarron		
	KOIL	Omaha	Belle West	Margaret Engdahl	
	WOW	Omaha	~~Margaret Kelly~~	~~Yvonne Cottingham~~	~~Helen L. Lewis~~ 8/9/46
			~~Helen Whitney~~	~~Lucille Cannon~~	~~Barbara Bates~~ per card
	KGKY	Scottsbluff	Sharon Saunders		

DISTRICT 11. MICHIGAN (PART), MINNESOTA, N. DAKOTA, S. DAKOTA, WISCONSIN

MICH.	WJMS	Ironwood	Rose Isaac	Laura Johnson	
MINN.	KDAL	Duluth	Elizabeth Daniels	Terese Pollock	Beverly Wenstrom
	WDSM	Duluth	Carol Sher		
	WEBC	Duluth	Elgie Carter	Jean Emerson	
	WMFG	Hibbing	Ruth E. Coe		
	KYSM	Mankato	Peggy Jo Lindholm	Francelia Stewart	
	WCCO	Minneapolis	Darragh Aldrich	Corinne Hoit	
	WDGY	Minneapolis	Bette Boyer	Shirley Bell	Vivian H. Bulmer
			Ella May Johnson	Irma Coffren	
	WLOL	Minneapolis	Letitia Post	Marvis Henrickson	Marjorie Dunn
	WTCN	Minneapolis	Arleth Haeberle	Judy Bryson	Mary Jane Fisher
	KVOX	Moorehead & Fargo	Jocelyn Birch		
	KROC	Rochester	Mary Miller (Marjorie Hope)		Johnnie Jurgenson
			Susan Smock		
	KFAM	St. Cloud	Patricia Pattison	Lucille Miller	
	KSTP	St. Paul	Dorothy Spicer		
	WMIN	St. Paul	Ruth Gilmore	Helen Connelly	Helen Nesgard
	KWIM	Willmar	Irene Peters		
	KWNO	Winona	Marjorie Mitchell		
N.D.	KFYR	Bismarck	Elizabeth Roether	Dorothy Pulley	Nina Mitchell
	WDAY	Fargo	~~Anne Collins~~ 8/20/46	Mildred Gregerson	Sophie Hancock
S.D.	KABR	Aberdeen	Lois Clockain		
	KOTA	Rapid City	Ruth Sherman		
	KELO	Sioux Falls	Inez Blekre		
	KSOO	Sioux Falls	Bee Baxter		
	WNAX	Yankton	Wynn Hubler		
WIS.	WEAU	Eau Claire	Betty Moskowitz		
	WKBH	LaCrosse	Cora Hauser	Berneice Callaway	

DISTRICT 12. KANSAS, OKLAHOMA

KANS.	KGNO	Dodge City	Helen B. Davis	Dorothy Stavig		
	KTSW	Emporia	Miriam Porter			
	KVGB	Great Bend	Mrs. Clem Morgan			
	KWBW	Hutchinson	V. West	Lucille Neighbors		
	KCKN	Kansas City	~~Erma Titus~~	~~Kay Weer~~	~~Marty Horner~~	8/9/46
			~~Almeda Boeth~~			
	KANS	Wichita	~~Kathleen Hite~~ 8/29/46	Jan Holt	Josephine Rice	
	KFH	Wichita	Iola Powell			
	WFBI	Wichita	Dorothy Fuller			
OKLA.	KVSO	Ardmore	Dolly Dutton			
	WKY	Oklahoma City	Helen Barr	Betty Jean Givens	Julie Bennel	
	KOCY	Oklahoma City	Louise Maystick			
	KTOK	Oklahoma City	Margie Lea			
	KGFF	Shawnee	Maxine Eddy	Jean Quillin	Verna Ruth Forston	
KOMA	~~KOME~~	Tulsa	Lucile Burns			
	KTUL	Tulsa	Mrs. Wm. G. Gillespie			
	KVOO	Tulsa	Evelyn Lynne	Norma Cohen	Nell Marie Peterson	

DISTRICT 13. TEXAS

TEXAS	KRBC	Abilene	LaFawn Hall	Frances Evans	Mrs. Ann O. Smart	
			Evelyn Driggers	Betty Fulton		
	KNOW	Austin	Elenor Lamb	Elaine Kincaid	Mrs. Ester Buffler	
			Jo Ann Switzer	Mrs. Brian Lang		
	KTBC	Austin	~~June Warner~~ 9/4/46	Thelma Bradshaw	~~Dorothy Cloud~~	9/4/46
	KFDM	Beaumont	Helen Caldwell			
	KRIC	Beaumont	Martha Swafford	Virginia Moon		
	KRIS	Corpus Christi	Mrs. Shirley Keel	Frances Scott		
	KAND	Corsicana	Helen Jean Fletcher			
	WFAA	Dallas	Velma Boice	Diana Dale	Virginia Montague	
	WRR	Dallas	Mrs. Charles A. Myers			
	KROD	El Paso	Dorothy Reed			
	KTSM	El Paso	Alice Barry			
	KGKO	Ft. Worth	Frances Helm	Mrs. Kathryn Pritchett	Eileen Flake	
			Lynn Trammell			
	KFJZ	Ft. Worth	Frances Williamson			
	KLUF	Galveston	Helen D. Clough			
	KXYZ	Houston	Glenn Horton			
	KPAB	Laredo	Mrs. Doane Chapman	Geneva Chambers	Mrs. Loretta Gray	
	KFRO	Longview	Mrs. James R. Curtis			
	KFYO	Lubbock	Kay McKenna	Josephine Callame		
	KNET	Palestine	Mrs. Emo Laurie			
	KPDN	Pampa	Lora Johnson			
	KPLT	Paris	Minnie Gilliland	Mrs. Geneva Chandler		
	KIUN	Pecos	Louise Hawkins			
	KVOP	Plainview	Frankie Davenport	Joyce Taylor		
	KPAC	Port Arthur	Corinne Enos	Mrs. Margaret Brieske		
			Miss Elweita Powers	Mrs. Marjorie R. Vickers		
KGKL	~~KTSC~~	San Angelo	Jean Nettleton			
	KABC	San Antonio	Lily Juncker	Violet Strombeck	Sybil Chastang	
	KTSA	San Antonio	Violet Short	Mildred Jordan		
	WOAI	San Antonio	Marjorie Hart			
	KGKB	Tyler	Mrs. James G. Ulmer			
	WACO	Waco	Mary Holliday			

DISTRICT 14. COLORADO, IDAHO, MONTANA, UTAH, WYOMING

COLO.	KMYR	Denver	Dolores Plested	Martha Goetz	
	KOA	Denver	Evadna Hammersley		
	KPOF	Denver	Kathleen M. White	Carolyn F. Staats	Alma White
	KFXJ	Grand Junct.	Mildred Townsend		
IDAHO	KIDO	Boise	~~Ann Louise Herbert~~ 12/13		
	KID	Idaho Falls	Lucille Buddy		
	KSEI	Pocatello	Ruth A. Fletcher		
	KTFI	Twin Falls	Florence Gardner	Betty Fenson	Lenore Otto
			Charlotte Donnelly		
MONT.	KGHL	Billings	Virginia Braunberger		
	KGEZ	Kalispell	Alicia C. Byers		
	KGVO	Missoula	~~Erin Day~~	~~Mary Berthold~~	~~Marion Fugman~~ 9/4/46
			~~Carol Holland~~	~~Ruth G. Mosby~~	~~Mrs. Berlin Boyd~~ acct to la
			J. C. Cole, Mgr.		
UTAH	KVNU	Logan	Virginia Church		
	KOVO	Provo	Cynthia Blood		
	KDYL	Salt Lake	Mildred Baker	Mary Jane Anderson	Donna Norton
			Ruth Dewsnip	Betty Haskell	
	KSL	Salt Lake	Louise Hill Howe	Gladys W. Pinney	Helen Ann Yound
	KUTA	Salt Lake	June Lee	Elizabeth Carter	
WYO.	KDFN	Casper	Mrs. D. L. Hathaway		
	KFBC	Cheyenne	Margaret O'Brien		
	KVRS	Rock Spring	Marjorie McCracken	Alma Larsen	
	KWYO	Sheridan	Nova Spracklin		

DISTRICT 15. CALIFORNIA (also in DISTRICT 16), NEVADA, HAWAII

CALIF.	KIEM	Eureka	Mary Martin	Viola Susan	Betty Lundeen
			Mary Lou Stuart		
	KFRE	Fresno	Frances Quinn		
	KMJ	Fresno	Pauline Edwards Jones	Aurora Vartikian	
			Elizabeth Lake	Margaret Vogelsang	Dorothy Puerta
			Elizabeth B. Kircher		
	KDON	Monterey	Marjorie Warren	Roberta June Hollmar	
	KLX	Oakland	Ruth Franklin	Gladys Herst	
	KROW	Oakland	Mercedes Prosser	Virginia Mahoney	
	KWBR	Oakland	Mrs. Jan Butler	Sylvia L. Chandler	
	KFBK	Sacramento	Frances Freter	Ruth Dunlop	
	KROY	Sacramento	Evangeline Baker		
	KGO	San Francisco	Ann Holden		
	KYA	San Francisco	Ruth Thompson		
	KJBS	San Francisco	Mildred V. Bowyer	Mildred Ramey	Betty Thompson
			Marcia Hoyt		
	KPO	San Francisco	Dorothy Rankin		
	KSFO	San Francisco	Margery Trumbull	Dorothea Walker	
	KQW	San Jose	Louise Taber		
	KSRO	Santa Rosa	Marion Deulin	Elaine Swain	
	KGDM	Stockton	Edith Smith	Elsie Flower	Marion Dinsmore
	KTKC	Visalia	Jeanne Bradley		
NEVADA	KOH	Reno	Betty Ann Barr		
HAWAII	KGMB	Honolulu	~~Ruth Acherman~~	Leslie Cunningham	Doris Harger
			Sue Gordon	Marian Ruane	

DISTRICT 16. ARIZONA, CALIFORNIA, NEW MEXICO

ARIZ.	KOY	Phoenix	Jane Connelly		
	KTAR	Phoenix	Betty Erickson		
	KYCA	Prescott	Roberta M. Pfister	Marcia Gates	
	KTUC	Tucson	Irene Stanlis		
CALIF.	KERN	Bakersfield	Edna Stevenson	Viola Rose	Vivian Rinker
			Marion De Cue	Eleanore Primo	
	KROP	Brawley	Lorraine Warne	Lillian Phillips	
	KECA	Hollywood	Frances Scully	Katherine Calvert	Virginia West
	KNX	Hollywood	Nancy Holme	Ona Munson	Margaret Cool
			~~[illegible]~~	Edith Todesca	Louise Belden
			Jean Meredith		
	KFOX	Long Beach	Martha Gaston		
	KGER	Long Beach	Irene Cook	Helene Smith	Evalyn Dobyns
	KFAC	Los Angeles	Lucille Blake		
	KFI	Los Angeles	Mirandy Helen Murray Hall		Jean Schaffer
			Ann Carlyle		
	KHJ	Los Angeles	Norma Young	Ruth Barnard	Harriet Crouse
			Judith Smith	Betty Kobald	
	KRKD	Los Angeles	Venna Taylor	Glad Hall	
	KWKW	Pasadena	14/5 ~~Ora Belle Thourich~~	Claire Hughes	Gwendolyn Peacher
			Jewell Crandall		
	KPRO	Riverside	Mildred Thorne	Patricia Shreeder	Georgeann Kimbell
			Thelma Sales	Patricia B. Neely	Marjorie Sharpe
			Mildred Cosman	Lorraine Warren	
	KFXM	San Bernardino	Pearl Kannenberg		
	KFMB	San Diego	Shirley Bradley		
	KFSD	San Diego	Mrs. Alys Phreaner		
	KTMS	Santa Barbara	Barbara Jean McCaffrey	Barbara Jean McGee	
			Virginia Brown		
N.M.	KFUN	Las Vegas	Dorothy G. Thwaites		
	KGFL	Roswell	Alice Lee Sawyers		
	~~KVEC~~	~~San Luis Obispo~~	~~Anita Banning~~	removed 9/4/46 (no such p.o. in state)	

Total 985

DISTRICT 17. ALASKA, OREGON, WASHINGTON

						.68 *
						1.32
ALASKA	KFAR	Fairbanks	Miriam Dickey			.12
	KINY	Juneau	Betty Gruening			.28
						.78
						.57
OREGON	KAST	Astoria	Mary Juhlin			.49
	KBND	Bend	Eunice Flowers			.75
	KODL	The Dalles	Margaret B. Kinsey			.29
	KORE	Eugene	Laura Nidever	Marjorie Jac		.53
	KUIN	Grants Pass	Patricia Bertrand			.65
	KLBM	LaGrande	Jayne Moss	Mrs. Clara M		.50
	KOOS	Marshfield	Bertha Jane Parker	Sara L. Spau		.87
	KMED	Medford	Gladys LaMar			.39
	KALE	Portland	Margaret Allyn	Roxie Freder		.44
	KEX	Portland	Kay West			.57
	KGW	Portland	Evelyn Lampman	Thelma Agost		.62
	KOIN	Portland	Clare Hays			9.85 *
	KRNR	Roseburg	Iris Rice Helliwell			*
	KSLM	Salem	W.O. Talbot, Jr.	Maxine Burer		
WASH.	KXRO	Aberdeen	Lois Johnson			
	KVOS	Bellingham	Georgia Hale			
	KELA	Centralia	Elsie Gaylord	Pat Attridg		
	KWLK	Longview	Marjorie Hyde			
	KGY	Olympia	Margie Donnell	Eva Knitson		
	KONP	Pt. Angeles	Esther Webster			
	KEVR	Seattle	Rosalie Claire Norton	Wilma E. Walters		
	KJR	Seattle	Loyal Lamont	~~Ann Sterling~~ 12/13		
	KOL	Seattle	Sharon Kane	Ann Bowden	Margaret Ward	
	KOMO	Seattle	Dorothy Lee			
	KXA	Seattle	Helen Marie Brennan	Margaret Dierringer		
	KFIO	Spokane	Geri Lindsey			
	KFPY	Spokane	Marguerite Sherwin	Marilyn McGuire	Helen Alexieve	
			Gail Gardner	~~Edna Storms~~ 12/13	Rita Brown	
			Jane Phillips			
	KGA	Spokane	Lucille Eddy			
KHQ	~~KHQ~~	Spokane	Lucille Eddy			
	KMO	Tacoma	Gail Clark			
KTBI	~~KTBI~~	Tacoma	~~Peggy Makeffay~~	~~Natasha M. Gehrt~~	8/20/46	
	KVAN	Vancouver	Charlene Jackson	Joy Vinton		
	KUJ	Walla-Walla	Adaline Bussard			
	KPQ	Wenatchee	Virginia Maus	Meryle Thompson	Mae Hughes	
			Mary Dallhauser	Mrs. Kelly Hughes		

Total 985

DISTRICT 17. ALASKA, OREGON, WASHINGTON

ALASKA	KFAR	Fairbanks	Miriam Dickey		
	KINY	Juneau	Betty Gruening		
OREGON	KAST	Astoria	Mary Juhlin		
	KBND	Bend	Eunice Flowers		
	KODL	The Dalles	Margaret B. Kinsey		
	KORE	Eugene	Laura Nidever	Marjorie Jackson	
	KUIN	Grants Pass	Patricia Bertrand		
	KLBM	LaGrande	Jayne Moss	Mrs. Clara Moss	
	KOOS	Marshfield	Bertha Jane Parker	Sara L. Spaugh	
	KMED	Medford	Gladys LaMar		
	KALE	Portland	Margaret Allyn	Roxie Frederickson	
	KEX	Portland	Kay West		
	KGW	Portland	Evelyn Lampman	Thelma Agosti	Elsie Gillies
	KOIN	Portland	Clare Hays		
	KRNR	Roseburg	Iris Rice Helliwell		
	KSIM	Salem	W.O. Talbot, Jr.	Maxine Buren	
WASH.	KXRO	Aberdeen	Lois Johnson		
	KVOS	Bellingham	Georgia Hale		
	KELA	Centralia	Elsie Gaylord	Pat Attridge	
	KWLK	Longview	Marjorie Hyde		
	KGY	Olympia	Margie Donnell	Eva Knitson	
	KONP	Pt. Angeles	Esther Webster		
	KEVR	Seattle	Rosalie Claire Norton	Wilma E. Walters	
	KJR	Seattle	Loyal Lamont	~~Ann Sterling~~ 12/13	
	KOL	Seattle	Sharon Kane	Ann Bowden	Margaret Ward
	KOMO	Seattle	Dorothy Lee		
	KXA	Seattle	Helen Marie Brennan	Margaret Dierringer	
	KFIO	Spokane	Geri Lindsey		
	KFPY	Spokane	Marguerite Sherwin	Marilyn McGuire	Helen Alexieve
			Gail Gardner	~~Edna Storms~~ 12/3	Rita Brown
			Jane Phillips		
	KGA	Spokane	Lucille Eddy		
KHQ ~~KMO~~		Spokane	Lucille Eddy		
	KMO	Tacoma	Gail Clark		
KTBI	~~KPSH~~	Tacoma	~~Peggy McAuffey~~	~~Martha M. Gehrt~~	8/20/46
	KVAN	Vancouver	Charlene Jackson	Joy Vinton	
	KUJ	Walla-Walla	Adaline Bussard		
	KPQ	Wenatchee	Virginia Maus	Meryle Thompson	Mae Hughes
			Mary Dallhauser	Mrs. Kelly Hughes	

Total 985

CHANGES IN AWB LISTING

ADDITIONS

District 9	Anne Collins	WCNT	Centralia, Ill.
District 14	Trula Swinehart	KIDO	Boise, Idaho
District 13	Peggy Williamson	KGNC	Amarillo, Tex.
" "	Irene Dale	KGNC	Amarillo, Tex.
" "	Elizabeth Miesse	KGNC	Amarillo, Tex.
" "	Christine Tinsley	KGNC	Amarillo, Tex.
District 10	Gene Gregg	KSO	Des Moines, Iowa
District 11	Jean P. Mitchell	KOTA	Rapid City, S. D.
District 5	Alaine Powell	WQAM	Miami, Fla.
District 5	Marjorie Christopher	WQAM	Miami, Fla.
District 3	Kit Crane	WIP	Philadelphia, Penn
"	Frances Mc Guire	WPEN	Philadelphia, Penn.
District 5	Kay Stanley	WMBR	Jacksonville, Fla.
District 10	Mary Rankin	KVFD	Ft. Dodge, Iowa
District 10	Elaine Jabenis	WOW	Omaha, Nebr.
District 17	Ann Sterling	KOMO	Seattle, Wash.
District 16	Helen V. Hyde	KNKW	Pasadena, Calif.
District 1	Marge Marnie	WPRO	Providence, R. I.
District 6	Kay Allen	WMPS	Memphis, Tenn.
District 15	Juel Neal	KNX	Hollywood, Calif.
District 1	Claire Gibson	WONS	Hartford, Conn.
District 5	Tee Brown	WBRC	Birmingham, Ala.
District 7	Mrs. Phil Houston	WCOL	Columbus, Ohio
District 8	Mrs. Fran Harris	WWJ	Detroit, Mich.
District 6	Bobbie Forster	KXLR	N. Little Rock, Ark.
District 13	Kay Deaver	KTSM	El Paso, Tex.
District 5	Virginia Roundtree	WGCP	Savannah, Ga.
District 17	Margaret Smith	KEPY	Spokane, Wash.
District 2	Minerva Davenport	WTTM	Trenton, N.J.
District 9	Virginia Craig	WDZ	Tuscola, Ill.
District 8	Elizabeth Evans	WKMO	Kokomo, Ind.
District 3	Zella Harper	WIBG	Philadelphia, Penn.
District 13	Monette Shaw	KABC	San Antonio, Tex
" "	Josephine Kemendo	WOAI	San Antonio, Tex.
" "	~~Betty Burns~~	~~KTSA~~	~~San Antonio, Tex.~~
" "	~~Betty Jane McHugh~~	~~KTSA~~	~~San Antonio, Tex.~~
" "	~~Jane Rowley~~	~~KONO~~	~~San Antonio, Tex.~~
" "	Mrs. Ruth A. Burleson	KCOR	San Antonio, Tex.
" "	Mrs. Natalie Zogheib	KMCA	San Antonio, Tex.
District 4	Alice Lane	WWDC	Washington, D. C.
District 1	Joan Lloyd	WSTC	Stamford, Conn.
District 17	Edna Storms	KGA	Spokane, Wash.
District 10	Katherine M. Neumann	KMBC	Kansas City, Mo.
District 7	Marcia Richardson	WKYB	Paducah, Ky
District 10	~~Rosemary Howard~~	~~WHB~~	~~Kansas City, Mo.~~
" "	~~Mary Sue Howard~~	~~WHB~~	~~Kansas City, Mo.~~
" "	~~Gennii Pruett~~	~~WHB~~	~~Kansas City, Mo.~~
District 4	Helen Mobberly	WWDC	Washington, D. C.
" "	Bliss Harris	WARL	N. Arlington, Va.
" "	Ruth Mulzey	WARL	N. Arlington, Va.

DELETIONS

~~District 14~~	~~Ann Herbert~~	~~KIDO~~	~~✓~~	~~Boise, Idaho~~
~~District 3~~	~~Frances Mc Guire~~	~~WLP~~	~~✓~~	~~Philadelphia, Penn~~
District 15	Ruth Acherman	KGMB	✓	Honolulu, Hawaii ← taken off
~~District 5~~	~~Ann Lee Stagg~~	~~WMBR~~	~~✓~~	~~Jacksonville, Fla.~~
~~" "~~	~~Nadine Williams~~	~~WMBR~~	~~✓~~	~~Jacksonville, Fla.~~
~~District 17~~	~~Ann Sterling~~	~~KJR~~	~~✓~~	~~Seattle, Wash.~~
~~District 16~~	~~Ora Belle Theurich~~	~~KWKW~~	~~✓~~	~~Pasadena, Calif.~~
~~District 1~~	~~Jane Mc Manus~~	~~WPRO~~	~~✓~~	~~Providence, R. I.~~
~~District 9~~	~~Adelaide Ayers~~	~~WDZ~~	~~✓~~	~~Tuscola, Ill.~~
~~District 5~~	~~Margaret Cotton~~	~~WBRC~~	~~✓~~	~~Birmingham, Ala.~~
~~District 7~~	~~Kay Kelsner~~	~~WOSL~~ WCOL	~~✓~~	~~Columbus, Ohio~~
District 10	Arlene Armstrong	KVFD	✓	Ft. Dodge, Iowa
~~District 4~~	~~Lucy Elliott~~	~~WWDC~~	~~✓~~	~~Washington, D. C.~~
~~District 5~~	~~Gertrude Handley~~	~~WRBL~~	~~✓~~	~~Columbus, Ga.~~
~~District 17~~	~~Edna Storms~~	~~KFPY~~	~~✓~~	~~Spokane, Wash.~~
~~District 10~~	~~June Martin~~	~~KMBC~~ KFPY	~~✓~~	~~Kansas City, Mo.~~

CHANGES IN AWB LISTING

ADDITIONS

Anne Collins	WCNT	Centralia, Ill.
Trula Swinehart	KIDO	Boise, Idaho
Peggy Williamson	KGNC	Amarillo, Tex.
Irene Dale	KGNC	Amarillo, Tex.
Elizabeth Miesse	KGNC	Amarillo, Tex.
Christine Tinsley	KGNC	Amarillo, Tex.
Gene Gregg	KSO	Des Moines, Iowa
Jean P. Mitchell	KOTA	Rapid City, S. D.
Alaine Powell	WQAM	Miami, Fla.
Marjorie Christopher	WQAM	Miami, Fla.
Kit Crane	WIP	Philadelphia, Penna.
Frances McGuire	WPEN	Philadelphia, Penna.
Kay Stanley	WMBR	Jacksonville, Fla.
Mary Rankin	KVFD	Ft. Dodge, Iowa
Elaine Jabenis	WOW	Omaha, Nebr.
Ann Sterling	KOMO	Seattle, Wash.
Helen V. Hyde	KWKW	Pasadena, Calif.
Marge Marnie	WPRO	Providence, R. I.
Kay Allen	WMPS	Memphis, Tenn.
Juel Neal	KNX	Hollywood, Calif.
Claire Gibson	WONS	Hartford, Conn.
Tee Brown	WBRC	Birmingham, Ala.
Mrs. Phil Houston	WCOL	Columbus, Ohio
Mrs. Fran Harris	WWJ	Detroit, Mich.
Bobbie Forster	KXLR	N. Little Rock, Ark.
Kay Deaver	KTSM	El Paso, Tex.
Virginia Roundtree	WGCP	Savannah, Ga.
Margaret Smith	KHPY	Spokane, Wash.
Minerva Davenport	WTTM	Trenton, N. J.
Virginia Craig	WDZ	Tuscola, Ill.
Elizabeth Evans	WKMO	Kokomo, Ind.
Zella Harper	WIBG	Philadelphia, Penna.
Monette Shaw	KABC	San Antonio, Tex.
Josephine Kemendo	WOAI	San Antonio, Tex.
Mrs. Ruth A. Burleson	KCOR	San Antonio, Tex.
Mrs. Natalie Zogheib	KMCA	San Antonio, Tex.
Alice Lane	WMDC	Washington, D. C.
Joan Lloyd	WSTC	Stamford, Conn.
Edna Storms	KGA	Spokane, Wash.
Katherine M. Neumann	KMBC	Kansas City, Mo.
Marcia Richardson	WKYB	Paducah, Ky.
Helen Mobberly	WWDC	Washington, D.C.
Bliss Harris	WARL	N. Arlington, Va.
Ruth Mulzey	WARL	N. Arlington, Va.

DELETIONS

Ann Herbert	KIDO	Boise, Idaho
Frances McGuire	WIP	Philadelphia, Pann.
Ruth Acherman	KGMB	Honolulu, Hawaii
Ann Lee Stagg	WMBR	Jacksonville, Fla.
Nadine Williams	WMBR	Jacksonville, Fla.
Ann Sterling	KJR	Seattle, Wash.
Ora Belle Theurich	KWKW	Pacedena, Calif.
Jane McManus	WPRO	Providence, R. I.
Adelaide Ayers	WDZ	Tuscola, Ill.
Margaret Cotton	WBRC	Birmingtham, Ala.
Kay Keltner	WCOL	Columbus, Ohio
Arlene Armstrong	KVFD	Ft. Dodge, Iowa
Lucy Elliott	WWDC	Washington, D.C.
Gertrude Handley	WRBL	Columbus, Ga.
Edna Storms	KFPY	Spokane, Wash.
June Martin	KMBC	Kansas City, Mo.

Changes made 11/26/46

WOMEN'S BUREAU
NOV 15 1946
DEPARTMENT OF LABOR

Changes in AWD Listing

Additions

Mich.	Dist.	8	WJEF	Dorothy Franke	Grand Rapids
Miss.	"	6	WQBC	Mary Van Cashman	Vicksburg
N.C.	"	4	WWNC	Elizabeth Taylor	Asheville
Texas	"	13	KTSA	Betty Burns & Betty Jane McHugh	San Antonio
Texas	"	13	KONO	Jane Rowley	San Antonio
Okla.	"	12	WKY	~~Patty Roberts, Florence Hutchison~~	Director of Women's Programs
				~~Sue Michener, Dolores Kerns~~	
				~~Jessie L. Fulton, Rita Young~~	Oklahoma City
Mo.	"	10	WHB	Rosemary Howard, Gennii Pruitt	Kansas City
Mo.	"	10	KMBC	Mrs. Ora Howard	Kansas City
Ohio	"	7	WMOH	Milly Soule	Hamilton
Texas	"	13	KRIS	Virginia Graham	Corpus Christi
N.Mex.	"	16	KTRC	Alice Lee Sawyers	Sante Fe
Calif.	"	16	KIST	Mary Mason	Santa Barbara
Texas	"	13	KRIG	Kay McKenna	Odessa
Calif.	"	16	KNX	Evelyn Lifschultz	Los Angeles
N.Y.	"	2	WSGA	Beth Lee	Schenectady
Okla.	"	12	KOCY	Dorothy Wills	Oklahoma City

Deletions

Mich.	"	8	WJEF	Anita Verdier	Grand Rapids
Calif.	"	16	KWKW	Gwen Peacher	Pasadena
N.C.	"	4	WWNC	Priscilla Parker	Asheville
N.J.	"	2	WAWZ	Helen Smith	Zarepath
Nebr.	"	10	WOW	Barbara Bates	Omaha
Ind.	"	8	WISH	Dorothy Braun	Indianapolis
Texas	"	13	KRIS	Shirley Keel	Corpus Christi
Texas	"	13	KFYO	Kay McKenna	Lubbock
N.Mex.	"	16	KGFL	Alice Lee Sawyers	Roswell
Calif.	"	16	KNX	Louise Belden, Margaret Cool	Los Angeles
Wash.	"	17	KHQ	Rita Brown, Phillips, Sherwin, McGuire	Spokane
				Alexieve, Gardner	The Dalles
Ore.	"	17	KODL	Margaret Kinsey	Marshfield
Ore.	"	17-	KOOS	Berthe Jane Parker	Salem
Ore.	"	17	KSLM	Talbot, Buren	Tacoma
Wash.	"	17	KTBI	Peggy Mahaffay	Portland
Ore.	"	17	KGW	Thelma Agosti	San Francisco
Calif.	"	15	KJBS	Marcia Hoyt	

Corrections in Call Letters

KOMA - Oklahoma City instead of KOME
WSLS - Roanoke, Va. instead of WSIS
WBLK - Clorsburg, W.Va. instead of WBLH
WJLS - Beckley, W.Va. instead of Berkley

Dup-

Changes in AWD Listing

Additions

Mich.	Dist.	8	WJEF	Dorothy Franke	Grand Rapids
Miss.	"	6	WQBC	Mary Van Cashman	Vicksburg
N. C.	"	4	WWNC	Elizabeth Taylor	Asheville
Texas	"	13	KTSA	Betty Burns & Betty Jane McHugh	San Antonio
Texas	"	13	KONO	Jane Rowley	San Antonio
Okla.	"	12	WKY	Patty Roberts, Florence Hutchison Sue Michenar, Dolores Kerns Jessie L. Fulton, Rita Young	Oklahoma City
Mo.	"	10	WHB	Rosemary Howard, Gennii Pruitt	Kansas City
Mo.	"	10	KMBC	Mrs. Ora Howard	Kansas City
Ohio	"	7	WMOH	Milly Soule	Hamilton
Texas	"	13	KRIS	Virginia Graham	Corpus Christi
N. Mex.	"	16	KTRC	Alice Lee Sawyers	Santa Fe
Calif.	"	16	KIST	Mary Mason	Santa Barbara
Texas	"	13	KRIG	Kay McKenna	Odessa
Calif.	"	16	KNX	Evelyn Lifschultz	Los Angeles
N. Y.	"	2	WBCA	Beth Lee	Schenectady
Okla.	"	12	KOCY	Dorothy Wills	Oklahoma City

Deletions

Mich.	"	8	WJEF	Anita Verdier	Grand Rapids
Calif.	"	16	KWKW	Gwen Peacher	Pasadena
N. C.	"	4	WWNC	Priscilla Parker	Asheville
N. J.	"	2	WAWZ	Helen Smith	Zarepath
Nebr.	"	10	WOW	Barbara Bates	Omaha
Ind.	"	8	WISH	Dorothy Braun	Indianapolis
Texas	"	13	KRIS	Shirley Keel	Corpus Christi
Texas	"	13	KFYO	Kay McKenna	Lubbock
N. Mex.	"	16	KGFL	Alice Lee Sawyers	Roswell
Calif.	"	16	KNX	Louise Belden, Margaret Cool	Los Angeles
Wash.	"	17	KEPY	Rita Brown, Phillips, Sherwin, McGuire, Alexieve, Gardner	Spokane
Ore.	"	17	KODL	Margaret Kinsey	The Dalles
Ore.	"	17	KOOS	Berthe Jane Parker	Marshfield
Ore.	"	17	KSLM	Talbot, Buren	Salem
Wash.	"	17	KTBI	Peggy Mahaffay	Tacoma
Ore.	"	17	KGW	Thelma Agosti	Portland
Calif.	"	15	KJBS	Marcia Hoyt	San Francisco

Corrections in Call Letters

KOMA - Oklahoma City, instead of KOME
WSLS - Roanoke, Va., instead of WSIS
WBLK - ~~Clersburg~~, W. Va., instead of WBLH
WJLS - Beckley, W. Va., instead of Berkley

Clarksburg

COPY

~~COPY~~

Kerr

Changes sent to Mrs. Strong on 10-7-46 for 355.
(From list sent from NAB, New York)

(COPY)

Additions

Kansas -	KGNO	Dodge City	Mrs. Helen B. Davis
	KTSW	Emporia	Miss Norma Jost
	KVGB	Great Bend	Mrs. Clem Morgan
	KWBW	Hutchinson	
	KCKN	Kansas City	
	KANS	Wichita	Josephine Rice
	KFH	Wichita	Iola Powell
	KFBI	Wichita	Bobbie Mack
Okla.	KVSO	Ardmore	
	WKY	Okla. City	Helen Barr
	KOCY	Okla. City	Helen B. Schuyler
	KTOK	" "	Margie Lea
	KOMA	" "	~~Helen Rogers~~ Woman's Editor 11/21/46
	KGFF	Shawnee	Maxine Eddy
	KOME	Tulsa	Lucille Burns
	KTUL	"	Mildred Gillespie
	KVOO	"	Nelle Marie Petersen
	KADA	Ada	Betty Hughes

Deletions

WKAQ	San Juan	Mrs. Alice Brown
KWQ	San Jose	Louise Taber
WFMD	Frederick	Roenna Fahrney
WBAL	Baltimore	Mollie Martin (Cotton's Radio name)

Additions

WCSH	Portland	Elizabeth Bradford
KTKC	Visalie	Dorothea Barnett
WFMD	Frederick	Eleanor Welker
KQW	San Jose	Madonna Todd
WKNB	New Britain	Virginia Murphy

Station Call Letter Correction

Marshalltown, Iowa — KFJB instead of KPJB

AWD MAILING LIST - CORRECTIONS, ADDITIONS, AND DELETIONS

STATION CHANGES	K E K L	San Angelo	- Should be K G K L
	K M Q	Spokane	- Should be K H Q
	K T S I	Takoma	- Should be K T B I
ADDITIONS	W J E F	Grand Rapids, Mich.	Miss Anita C. Verdier
	W T A R	Norfolk, Va.	Miss Alice White
	N B C	New York	Miss Adelaide Hawley
	K U G N	Eugene, Ore.	Miss Gere Arnold
	W F A A	Dallas, Texas	Mrs. Wilbur Douglas
	K I C D	Spencer, Iowa	Miss Louise M. Peckham
	W C A U	Baltimore, Md.	Miss Betti McCall
	W D A Y	Fargo, N. D.	Miss Joyce Rudh
DELETIONS	W J W	Cleveland, Ohio	Robin Russell
	W O L	Washington, D. C.	Marshall Adams
	W O L	Washington, D. C.	Florence Warner
	K A N S	Wichita, Kans.	Kathleen Hite
	W D A Y	Fargo, N. D.	Anne Collins
	K T B I	Tacoma, Wash.	Peggy Mahaffey
	K T B I	Tacoma, Wash.	Reitha M. Gehri
	N B C	New York, N. Y.	Alice Chapman

These corrections
sent to Mrs Strong 8/22/46

AWD MAILING LIST - CORRECTIONS, ADDITIONS, AND DELETIONS

WOMEN'S BUREAU
AUG 20 1946
DEPARTMENT OF LABOR

STATION CHANGES	K E K L	San Angelo	- Should be K G K L
	K N Q	Spokane	- Should be K H Q
	K T S I	Tacoma	- Should be K T B I

ADDITIONS	W J E F	Grand Rapids, Mich.	Miss Anita C. Verdier
	W T A R	Norfolk, Va.	" Alice White
	N B C	New York	" Adelaide Hawley
	K U G N	Eugene, Ore.	" Gere Arnold
	W F A A	Dallas, Texas	Mrs. Wilbur Douglad
	K I C D	Spencer, Iowa	Miss Louise M. Peckham
	W C A O	Baltimore, Md.	Betti McCall
	W D A Y	Fargo, N.D.	Joyce Rudh

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	K T B I	Tacoma, Wash.	Peggy Mahaffey
	K T B I	Tacoma, Wash.	Reitha M. Gehri
	N B C	New York, N.Y.	Alice Chapman

of olive oil annually, ...
for the Olive Oil Association ...

ARMY NEEDS RADIO WOMEN

Applicants Sought for Training as Operators and Technicians

The Second Service Command announced yesterday a plan to enroll young women between the ages of 21 and 44, inclusive, in the Women's Army Auxiliary Corps to be trained as radio operators and technicians for communication duties with the Army.

The applicants will receive a complete course in radio technique lasting six months at Paul Smith's College in the Adirondacks under the auspices of the United States Office of Education through the New York State Department of Education. Upon successful completion of the course, students will

CHRISTIAN SCIENCE MONITOR, BOSTON, THURSDAY, JULY 2, 1942

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Air Line Radio Operator

Wide World

Works With Eastern at Miami

Ann Kathryn Porter has realized her ambition—to be an air line operator. She works with Eastern Air Lines at Miami, Fla. At 15 she started to study international code and elementary electricity. A few years later Miss Porter was a licensed radio telephone operator. When war came she landed a job with the Army in the Radio Engineering Department at Fort Monmouth, N. J., the first girl to do this type of work. After three months Eastern Air Lines gave her a trial and she has been with them since.

N. Y. Boosts Big Surplus $54,127,4

By a Staff Correspondent o
The Christian Science Moni

ALBANY, N. Y., July 2–
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surplus of $54,127,419.
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OCCUPATIONS - RETAIL TRADES

WHOLESALE and RETAIL SERVICES

MAINE

As clerks in stores, and other types of employment, as in the World War.(May) Women reported as replacing men (Employment Service Report.)

MARYLAND

A filing station near Baltimore HAS hired 5 girls to serve gas, oil and water, after losing several men by draft. (Baltimore Sun, April 26, 1941.)

MICHIGAN

In Detroit about 30 women are working for the Fuller Brush Company in door to door selling. The branch manager says that the women are outselling the men in many cases and that some of the star salesmen make as high as $100 a week. Eight girls have been hired as drivers by the La Salle Cab Co. The Detroit Bank has taken to using girls as junior bank clerks in its branches. It takes four to six months for training. (Detroit Free Press, September 21, 1941.)

NORTH CAROLINA

In Charlotte a large grocery chain sought the aid of the Employment Service in finding women for jobs as package checkers, jobs formerly done by men. The use of women as soda dispensers is becoming commonplace in Charlotte, and a number of firms have requested the Employment Office to supply women for office work formerly handled by men. One ice cream firm hired a woman last week for the first time. According to the manager of the Charlotte Employment Offict, The trend toward hiring women is already definite enough to indicate that greater facilities will be needed to care for the children of women workers. (Charlotte Observer, September 26, 1941.)

PENNSYLVANIA

A Philadelphia service station has employed 6 young women to serve gas and oil and keep records. (N. Y. Times, August 28, 1941.)

In Harrisburg women are employed to sell oil and gas in two service stations. (Harrisburg News, June 26, 1941.)

WHOLESALE and RETAIL SERVICES continued

UNITED STATES

Faced with increasing loss of male workers in retail food stores, various trade associations are assisting their members in setting up training programs for women workers. One of these is the Super Market Institute, which states that some of the women clerks are proving most helpful because fo their greater familiarity with planning and preparation of meals. (Domestic Commerce, July 3, 1941.)

A representative of Sears, Roebuck & Co. told the National Retail Dry Goods Association at their mid-year convention that department stores are hiring more women and High School graduates since the draft. Some stores are using women in departments in which only men had been employed previously. (Washington Star, June 3, 1941.)

The Fuller Brush Co. recently announced a new policy of hiring women to fill the gaps in its sales ranks. There are 12 of them now operating in Cleveland. (Business Week, June 14, 1941.)

ARKANSAS

WOMEN checkers at the front counters of "help yourself" grocery stores were tried briefly by one store about a year ago, but the attempt was abandoned when it was found that the women had difficulty lifting the heavy baskets of groceries to the checking counter. However, employes of at least half a dozen women checkers during the past three weeks have gotten around this difficulty by making use of younger "package" boys to hoist the heavy bundles.
Arkansas Democrat, Little Rock, Ark. November 30, 1941.)

Women who have always held a majority of the positions as store sales men in Little Rock are increasing their lead every day now as they are finding selling and office jobs available accesory and machinery businesses formerly using only masculine employes.
Little Rock, Ark. Democrat, November 30, 1941.

Magazine Division
Office of War Information
Social Security Building
Washington, D. C.

WOMEN IN RETAIL TRADES

1. Jobs for which women are needed

Women are needed in the retail trades in any job which they can fill. Since so many of the men are leaving for the Army or for war plants, women are badly needed to take their places. The extent to which women have already replaced men in retail trades is indicated by the following figures from a retail store in a non-critical area: normal percentage of women employed, 60; percentage of women in May, 1943, 78. The proportion of women who must be employed to maintain the retail trades in the critical areas is considerably higher, and rising all the time. Fortunately, as the above figures indicate, women have always been employed fairly extensively in the merchandising business, and there are relatively few jobs which women cannot be trained to perform.

Department stores have opened the doors to women in many lines of work hitherto considered men's domain. Women are selling shoes, men's furnishings and men's clothing; they are selling the high-priced bulk goods--furniture, bedding, rugs, luggage, lamps--which used to be reserved for men, for no very good reason. Some stores report that women are doing better in the furniture department than the men did--the women customers are more impressed with the home-maker approach than the craftsman approach. In the non-selling field, girls are taking over as messengers and stock "boys", clerks, packers and wrappers; they are packing the glass and china which, oddly enough, used to be done almost exclusively by men. They are operating the elevators, doing the clean-up work, even driving the delivery trucks. One of the lines of department store work whith has been hard hit by the draft is the clerical-fiscal work. Women are now doing the auditing, research, statistical work, credit office work, and the new work involved in rationing and OPA regulations. Women are taking charge of the advertising and doing the copy writing; they are supervising the window decorating; they are taking over much of the administrative and managerial work--instead of the old "floor-walker" with a carnation in his buttonhole, you may now see a woman superintendent with a wide blue ribbon slung diagonally from her shoulder. And there are many women now in important executive positions in department stores.

B esides department store work, women are taking over in many other retail jobs hitherto traditionally done by men. They are working in haberdasheries, in shoe stores, in jewelry stores; they have have taken over the soda fountain, the cigarette counter and the cashier's desk in the corner drug store. In grocery stores, not only the grocery shelves and the cash registers, but in many places even the meat counters are "manned" by women. Some stores have arranged to have most of the butchering done in the warehouse, leaving only the smaller cutting jobs

to be done by the women behind the meat counter; in other stores the women do a real butchering job on whole sheep carcasses and quarters of beef, and belong to the meat cutters' union. Normally it takes about 10 men to run an average-sized chain grocery store; now many of these stores have only one or two men, the rest of the work being done by women.

2. Type of women needed; training

In most of the retail trades the requirements are not exacting. The clerical jobs require an ability to deal with figures, and the selling jobs usually entail standing up all day; but many older women are nevertheless entering the department stores as sales clerks. Many of the jobs are open to women with physical handicaps. There are numerous positions in which deafness is no hindrance: deaf-mutes are being used as wrappers, packers, porters; dwarfed and crippled women can fill many clerical positions. Training is usually on the job, and many department stores have regular courses in business English, accounting, color, design, executive training and other related subjects which are open, free, to any employee wishing to improve her position. In grocery stores, certain health standards usually have to be met, and such jobs as that of "butcherette" require several months' training.

3. Working conditions

Hours are regular in most of the retail trades, but there is great opportunity for part time work in the rush hours. Grocery stores need extra help on Fridays and Saturdays, when 60% of their week's business is done. They also welcome extra workers during the summer months. Department stores offer among the best opportunities available to women to advance into high-paid executive positions.

4. Labor supply problems

Besides the problem of filling the positions of the men who have left for the Army, the retail trades are faced with quite a problem in holding onto the women who are replacing them--especially the younger ones. Munitions plants and the armed forces keep luring them away the same as they do the men. The turn-over at one of Washington, D. C.'s big department stores, for instance, is normally 40% yearly; last year it was about 250%. On the other hand, many of the grocery stores report a very small turn-over among their new women workers, and expect many of them to stay on in the business after the war. The retail trades with the greatest labor problem, of course, are those like the coal industry, which can hardly be converted to womanpower.

5. Resistance

In department stores, there has been a certain amount of resistance from skeptical older executives to the substitution of women for men, but by now most of them have been won over by women's performance

in the business.

6. Job break-downs

The conversion to womanpower has necessitated a certain amount of rearrangement of the jobs which used to involve some heavy work. In the receiving departments, girls check and classify the goods, while men handle the heavy crates; in department stores, each department has a few "bulkmen" to do all the heavy work. This sort of job break-down has gone on in all industries which have converted to womanpower.

This material was compiled in connection with the program to promote full use of womanpower in necessary civilian jobs which is being sponsored by the Office of War Information and the War Manpower Commission with the cooperation of national magazines.

6/24/43

RETAILERS VICTORY CORPS

RETAILERS VICTORY CORPS

Its Organization

Its Objective

Its Creed

RETAILING is an essential industry whose principal function is to supply the daily needs of all people and to improve their standards of living by bringing to them merchandise of good quality at prices they can afford to pay.

THE RETAIL INDUSTRY is the third largest industry in this country.

One of every seven persons gainfully employed in the United States is engaged in some phase of RETAILING.

IN RETAILING more of those at the top started at the bottom than in almost any other industry.

To help establish in the public's mind a proper appreciation of the INDUSTRY and in recognition and appreciation of the thousands of faithful men and women who are doing their bit on the "HOME FRONT" by working in RETAIL STORES, the RETAILERS VICTORY CORPS has been organized.

This vast army on the "HOME FRONT" is engaged in an activity necessary to the maintenance of civilian morale.

This "HOME FRONT ARMY" has released many men and women for the "FIGHTING FRONT".

Not everyone can fight but everyone can serve. RETAILING presents an opportunity for service.

Many opportunities for service beyond the routine duties of the job present themselves each day; hoarding can be discouraged, Government regulations explained, waste eliminated and salvage encouraged.

For those workers in RETAIL STORES who have an appreciation of the opportunity for service and who will agree to serve to the best of their ability, a cordial invitation is extended to become a member of the RETAILERS VICTORY CORPS.

The CORPS is a non-profit organization; there is neither membership fee nor dues. The only requirements are that your employer shall nominate you for membership and that you shall accept the CREED OF THE CORPS. A badge will be furnished you by your employer which you are privileged to wear as long as you work in a RETAIL STORE.

The members of the RETAILERS VICTORY CORPS in a particular store may decide to elect officers, Captains and Lieutenants, and may adopt a program of their own to help the war effort. They can sell War Savings Stamps, they can engage in O. C. D. activities, they can help train new employees, etc.

Retailers Victory Corps Creed

1. I Believe Retailing is an essential industry whose principal function is to supply the daily needs of all people and to improve their standards of living by bringing to them merchandise of good quality at prices they can afford to pay.

2. I Believe that in order to build a successful and permanent business every sale must not only result in a profit to the store, but also give profit and satisfaction to the customer.

3. I Believe in the American system of free enterprise and in the value and importance of individual initiative; I am proud to be associated with an industry which offers opportunities and advancement to those with ambition, intelligence and resourcefulness.

4. I Believe that by working in a retail store I am doing my bit on the home front, and I shall endeavor to serve to the best of my ability. I shall do what I can to discourage hoarding. In my contacts with the buying public, I shall try to help maintain their morale.

5. I Believe in the supreme worth of the individual and in the dignity of labor; I shall accordingly be just to my fellow employees and associates.

6. I Believe that truth and honesty are fundamental in an enduring social order; I believe in the sacredness of a promise, and in the importance of preserving reputation and character.

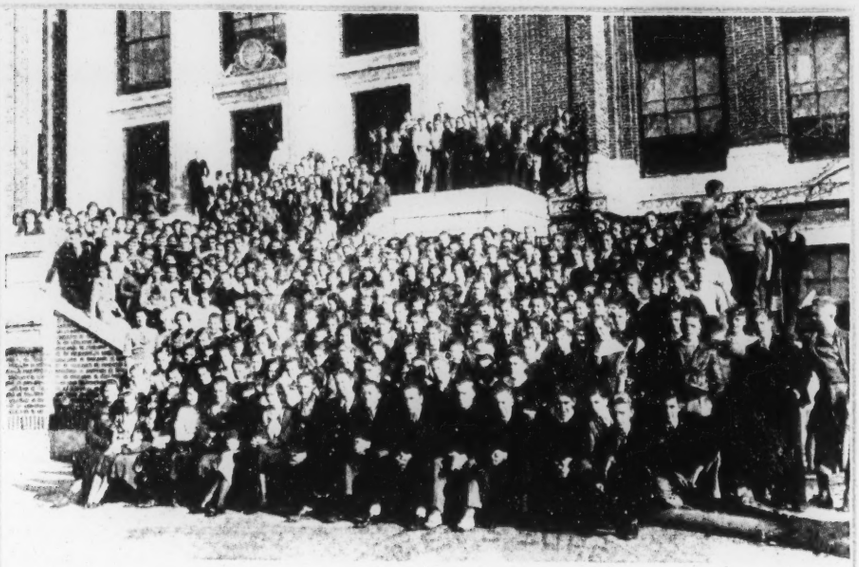
7. I Believe in the United States of America and in the democratic form of government; I pledge my support to the efforts of my country to preserve our institutions and to defend the freedom and liberties of our people.

Office of Finance
Continued Solve Personnel Problem in
Stationery Store Feb. 1943 P17.
Latil Stationery Co., Baton Rouge

Have had 2 women filling men's place a long time. Should now have 2 other girls. Will also train 2-3 men for heavy lifting. In meantime cannot have home buyers & slow sales. Have contacted them as available salesmen.

Type of girl who will make efficient clerical, or administrative work with stationery are progressive

(Mar & April - Suggestions for better layout, etc. of Letters Office with pictures "Improvements Constitute Development of Utilized Operation in the Office"



AFTER YOU FINISH SCHOOL WHAT?

Just you children, now you are going to be grown up. Yes, you are, dummy, you know you are. Just cut out the childish stuff. What are you going to do? The world in the main home and abroad in the country is

RETAILING

What are you going to do?

What are you going to be?

IF YOU CAN FIND WHAT YOU ARE BEST SUITED FOR YOU WILL BE HAPPIER DOING THAT

IF YOU TRAIN FOR YOUR JOB YOU WILL MORE LIKELY SUCCEED

THE OPPORTUNITY YOU HAVE

When you enroll in school you have the privilege of choosing which course you will take—what subjects you will study.

If you enroll in a RETAIL TRAINING CLASS:

(1) You will be in the classroom only part of the time, and part-time in a retail store. The store will be your laboratory.

(2) You will be paid for every hour spent in the store.

(3) You will be given full school credits for your store work. If you decide to go to college these credits will be accepted.

(4) You will graduate with your class, as in taking any other courses.

(5) You will learn if you like the work in stores.

(6) You will find out if you are suited for the work.

(7) You will gain valuable experience in the store. You will learn to sell. In after life you will need experience in selling no matter what you do. You will have to sell yourself and your services.

(8) You will learn to deal with people. In Retailing you will meet all sorts of people. As you learn to deal with them you will develop self-confidence. You will be rounding out your education.

IN ONE SOUTHERN STATE, HIGH SCHOOL STUDENTS LAST YEAR EARNED $60,000 BY WORKING PART-TIME IN RETAIL STORES.

WHAT RETAILING OFFERS YOU

★ RETAILING is an essential industry. It is the third largest industry in this country. One of every seven persons gainfully employed in the United States is engaged in some phase of Retailing.

★ IN RETAILING your work will be among pleasant surroundings. If you enjoy working with people you will like it. It is not monotonous for new scenes and new situations develop each day.

★ ALL JOBS IN RETAILING are not behind the counter. There are department heads, supervisors, assistant managers, and managers. There are buyers, personnel directors, and numerous other jobs which require special training and which offer unusual opportunity for those fitted and trained to fill those jobs.

★ SUCCESS IN RETAILING is a big success. Look around in your own community. Many of the most prominent citizens are those who have been successful in the retail field. Also, Retailing is a permanent industry.

★ IN RETAILING more of those at the top started at the bottom than in almost any other industry. Under war conditions, with the general shortage of workers, there is an exceptional opportunity now for those who enter Retailing after preliminary training, while at the same time patriotic service will be rendered by serving the daily needs of those on the Home Front.

★ SOMEONE HAS SAID "Retailing is one of the oldest occupations and one of the newest professions", meaning that there is now greater need for training to enter the Retail field than ever before. Also, it is significant that as the requirements for any job increase, the opportunities for those who meet the requirements also increase.

TAKE A LOOK AT THE FUTURE

Census figures show two out of every five high school graduates become Retail employees sooner or later. Why not get an early start, earn while you learn and have a record of experience to back you up when you leave school behind and look for the best possible job?

AFTER YOU FINISH SCHOOL - - - WHAT?

FOR MORE COMPLETE INFORMATION

Return to RFN
10/1/43

BUSI

OUTLOOK HERE GOOD FOR SMALL PLANTS

Dominance of Consumer Goods Means Quick Reconversion, Henrikson Asserts

EMERGENCY DRAINS CITED

New York Supplies Suffer From Huge Military Procurement for Outgoing Convoys

Although small business in the New York region suffered worse than in most other sections during the war's early stages, it will come out of the reconversion period quicker and easier because output and distribution of consumer goods dominates the local economy, Carl H. Henrikson Jr., regional business consultant of the United States Department of Commerce, declared yesterday.

In releasing the third quarterly report for 1943 titled "Small Business Looks to the Future in the New York Region," Mr. Henrikson pointed out that while the overflow of war work from other regions has greatly reduced distress in this area, intermittent huge military purchases have caused some acute shortages.

"Small retailers and wholesalers alike," he reported, "find it difficult to plan or to cope with sudden draining of stocks by intermittent large military purchases. New York City and the area it serves as wholesale supplier must suffer, because large emergency requisitions are necessarily made in the New York market for immediate loading on outgoing convoys. A few have suggested that procurement officers might better schedule their purchases and thus lessen the upsetting shocks to the New York areas. A near-famine in butter occurred recently, when a large order dried up supplies."

Outlook Encouraging

Commenting on the post-war outlook for small business in the New York region, Mr. Henrikson stated that only the broader outlines of what is in store can be recognized at this time.

"Fortunately," he added, "these present certain encouraging sides. It is inevitable that the economy of this region, dominantly that of producing and distributing consumer goods, will not suffer the terrific shocks of reconversion that will assail other regions. Only a small proportion of its total industry is in heavy production goods, lines in which reconversion is difficult and time-consuming. For this reason its small manufactur-

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Small merchants in this region have survived wartime conditions better than predicted, Mr. Henrikson commented, due to larger inventories than estimated and to ingenuity of manufacturers in supplying substitute products. Shorter hours, pooled deliveries, self-selection and training of part-time workers have been used to relieve emergency conditions.

"With fewer salesmen making fewer calls on the retail trade," he declared, "it becomes a distinct advantage for a small merchant to be close enough to his source of supply to make on-the-ground purchases. Shortened trucking routes and curtailed delivery schedules are a further advantage to smaller retailers in this area over those in other regions."

Aided By Many Groups

In addition to the efforts of the Smaller War Plants Corporation, small manufacturers in this region have received effective aid from State and municipal agencies, trade associations and chambers of commerce, he remarked. Organizations comprised of small business men have also been active.

When smaller manufacturers discuss what post-war reconversion has in store for them they wonder what the larger producers have "up their sleeves" in the way of new products and new designs that may require radical adjustments in their own operations, Mr. Henrikson pointed out. "They ponder too," he added, "whether a fair system of allocation of materials will be put into effect so they might compete in the inevitable race to get into civilian production.

"Those in the New York State part of the region feel certain that they will have the backing of the State Government in getting a square deal. Already the State Division of Commerce has been given appropriations to open additional district offices and has increased its personnel for the express purpose of assisting small business in its post-war problem."

OCCUPATIONS

PHYSICISTS

REPRODUCED AT THE NATIONAL ARCHIVES

REPRODUCED AT THE NATIONAL ARCHIVES

Magazine Division
Office of War Information
Social Security Building
Washington, D. C.

WOMEN PHYSICISTS

The shortage of physicists is so acute that a national committee has been established to advise Selective Service on the qualifications of individual physicists to insure that no single one is drawn from essential work. The National Roster of Scientific and Specialized Personnel estimates that fewer than 8,000 physicists are now in college. The need is far greater than the supply, and is likely to increase if the war is prolonged. The Engineering, Science and Management War Training Program of the United States Office of Education trains women for the following jobs:

1. Use of the spectrograph to analyze industrial materials

2. Production, calibration and use of optical instruments

3. Computation of data for the design of alternating and direct current electrical devices

4. Production of crystals for the comtrol of radio frequency in ship and aircraft transmitters

5. Design, building, testing, maintenance and operation of electronic devices

The United States Civil Service Commission needs Junior Physicists and Physicists, especially in the fields of electronics and radio, electricity, sound and optics. There are not enough physicists in the country to meet the Government needs at the present time.

Women with high school diplomas, college degrees, or long records of responsible industrial employment are eligible for training courses under the ESMWT. No outstanding physical requirements must be met, since the work is comparable to office work in its physical demands. Employers are reluctant to take women over 40 if they can get younger women. Qualifications for Civil Service positions are:

1. Junior Physicist - completion of all requirements for a bachelor's degree including or supplemented by at least 18 semester hours in physics.

2. Physicist - a major in physics or closely allied subjects.

3. Technical Assistants in Physics - from one to three years of college study plus courses in physics

REPRODUCED AT THE NATIONAL ARCHIVES

Most ESMWT courses last from 12 to 16 weeks. Full-time courses meet 40 or more hours a week, usually in the daytime. Part-time courses meet two or more evenings a week for two or three hours an evening. Special schedules can be arranged for employed persons. All training is of the scope and difficulty usual in college courses, but the courses are shorter and aimed at specific grounding leading to immediate employment. ESMWT courses are given at colleges and universities throughout the country. No tuition fees are required. Trainees must pay for textbooks and minor supplies.

Most of the jobs in these fields are not traditionally women's jobs, but they are being trained to take the place of men called to military service. About 140,000 women have thus far been trained in ESMWT courses in all fields. While there is still some employer resistance to the use of women, in practically all places where they have been given an opportunity to work, they have overcome this prejudice. Older and handicapped women can do these jobs if properly trained, but there is some employer resistance to their utilization.

Examples of women at work as physicists in industrial jobs can be secured from Mr. William T. Clark, United States Office of Education, Room 2249, Interior Building, Washington, D. C. For information on women holding jobs as physicists in Government Agencies, the following should be consulted: National Bureau of Standards; Navy Department, Bureau of Ships.

This material was compiled in connection with the program to promote full use of womanpower in <u>necessary civilian jobs</u> which is being sponsored by the Office of War Information and the War Manpower Commission with the cooperation of national magazines.

6-3-43

OCCUPATIONS - PLASTICS

REPRODUCED AT THE NATIONAL ARCHIVES

REPRODUCED AT THE NATIONAL ARCHIVES

WOMAN POWER IN THE PLASTICS INDUSTRY

Source: Modern Plastics, January 1943.

Contrary to what a lot of employers expected, the absenteeism among women has in the plastics industry proved to be less than among men. Perhaps the reason for this is the possibility of being drafted which makes men want to have a fling while they can, whereas women realize that they are on the job for the duration.

There is a definite handicap in hiring women for certain jobs in the plastics industry involving heavy lifting operations. It is also true that the heat of the press room often causes extreme fatigue among women and many find themselves unable to adjust to such work. Both of these factors may be overcome to some degree through the breaking down of jobs into multiple operations and having the lifting part of the operation done by a man or by several women; and by having adequate rest periods for overcoming the heat factor. Installing of water fountains or cold soft drink machines at centrally located spots throughout the plant will also tend to cut down loss of efficiency through heat fatigue. One plant has even found it pays big dividends to have a travelling water boy go through the plant.

The split shift as an experiment may be tried in several plastic plants in the near future. It is thought that by announcing a four-hour shift, local housewives in the community may be attracted, since they would also be able to do their housework, and not have to be on their feet so long.

WHAT JOBS CAN WOMEN DO?

Women can be used on a great variety of jobs in the plastics industry. For the purpose of this article, a survey of jobs being done in the industry by women has disclosed that the following are being done successfully:

FINISHING - Women run drill presses, grinders, lathes, sanders, tapping machines, automatic macines, multiple spindle drill presses, buffers, paint

REPRODUCED AT THE NATIONAL ARCHIVES

sprays, hand tools, files, chisels, scrapers, reamers, flexible shaft machinery.

INSPECTION - Women operate thread gages, plug gages, ring gages, snap gages, multiple gages, dial gages.

TOOL ROOM - Women run polishing machines, shapers, lathes, grinders, drill presses and do hand operations on the molds.

PRESS ROOM - Women run light hand molding presses; single ram presses from 3 to 15-inch; double ram presses from 6 to 8-inch; assemble and disassemble wedges; do pre-inspection and floor inspection; hi-spot testing.

DRAFTING ROOM - Women do ordinary drafting room work.

LABORATORY - Women chemists do the sort of work that the men do.

DESIGNING - Women artists do plastics designing.

One plastics mold maker has been extremely successful in using women in its tool rooms. These women work on all types of mold operations including cutting, grinding, polishing and all the various steps of tooling molds. The company has an extensive training program for women which is especially designed to fit tool room work as distinguished from a general training program applicable to the entire industry.

It is quite evident that employing women involves factors to which management has not given too much attention prior to the war. British experience and the experience in this country are sufficient to show how well women do jobs in industrial plants. They do require different handling, and different techniques for doing heavy jobs must sometimes be devised, but they are not so difficult to work with as to make it non-feasible to hire them in the plastics industry. One personnel manager in a laminating plant said that he considered women as being small men insofar as handling their jobs was concerned. They donot have great physical strength, they cannot lift heavy weights, and they fatigue more quickly, requiring more rest periods. But with

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all that, he declared that pound for pound a woman does as good a job as or better than a man in the factory once she is trained.

It is a challenge to the plastics industry's productive ingenuity as its man-power is slowly drained - a challenge which cannot be ignored and which must be successfully met.

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U. S. Department of Labor
WOMEN'S BUREAU
Washington

Three plastic firms in New Jersey, 1942.

#1 (flashlights, etc., all branches of the service)	Girls operate powers lamping machines and toggle presses, slashing machines, embossing machines, molding machines, and do spray painting and cementing plastics. Accidents to women all pertained to drill press and punch press (material slipped, or foot slipped, and finger injured by drill.) No time lost.
#2 (plastic parts for Army and Navy)	Girls are buffers, final inspectors, operate drill press, and do hand work on assembly.
#3 (plastic parts for Army and Navy)	Girls are drill and punch press operators, etc., cementing. Cuts out small parts from plastic sheets.

OCCUPATIONS

PROFESSIONAL + TECHNICAL

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OPPORTUNITIES FOR THE PROFESSIONALLY TRAINED

FROM THE VIEWPOINT OF SOCIETY

By Ewan Clague, Commissioner of Labor Statistics
U. S. Department of Labor

At the University of Wisconsin National Education Conference
October 8, 1948

For the past three-quarters of a century there has been a rapid growth of the professions in the American economy. During the period from 1870 to 1940 (that is, from the end of the Civil War to the beginning of World War II) there was a ten-fold increase in the professions as compared to a three-fold increase in the labor force as a whole. The professions increased faster than any other major occupational group. But even these facts do not tell the whole story. Within the professions themselves, there were some marked variations in trends. In the traditional professional fields of medicine, law, and the ministry, the growth was slower. It was in the new professions that the most spectacular growth occurred. For example, there was the emergence of the technical and scientific professions into a major group. There were only about 7,000 engineers in 1870, but more than a quarter of a million in 1940. This is also true in the fields of chemistry, physics, the biological sciences, accounting and administration.

There are new professions today which did not even exist in 1870. The war produced important changes in many professions. There was a great increase in the demand for engineers and scientists. Today there are about 100,000 more engineers at work than were employed in 1940. The demand of the atomic age for natural scientists has far exceeded the existing supply. Medicine has felt the impact of the postwar program of the Veterans Administration. The wartime spurt in the birth rate has brought about a critical shortage of teachers which has been accentuated by the exodus of teachers to other fields of employment. Taking all professional and semi-professional employment combined, there has been an increase from 3.3 million in 1940 to 4.1 million in April 1948.

The outlook for the near future is clearly along these same lines. The Bureau of Labor Statistics has estimated that there will be a need for about 5 million professional and semi-professional workers by 1960. This means a net growth of nearly a million additional workers. In addition, however, we must allow for the replacement of those who will be lost to the professional fields during the next 10 years. Such losses arise because of death, retirement, marriage or transfer to other occupations. Making these allowances, there would need to be a total increase of about 2-1/2 million persons who would need to be trained between now and 1960. This is an average of over 200,000 persons annually.

The interesting point is that this expansion in the professions will be distributed among nearly all of the major professional fields; even those which have been growing more slowly in the past may require many new practitioners. Among the fields in which there will be the greatest need are teaching, nursing, engineering, medicine, dentistry, the physical sciences, social work, law and pharmacy. In some of these it will be necessary to expand the facilities for professional training if the needs are to be met. Examples are medicine, dentistry, social work, and psychology.

Another factor of growing significance is the "professionalization" of many administrative occupations, both in government and in business. Here there are emerging some new professions which require college background and training. Accounting was the first of these, but this development has now extended to personnel work, industrial relations, purchasing, marketing, and traffic management, as well as business administration in general.

If we add the training needs in these fields to those previously accounted for, it is evident that the previous estimate of 200,000 graduates annually may be much too low. It is difficult to estimate the numbers involved in these new administrative occupations, but, for the sake of argument, we might assume it to be about half as large as all the others combined. This would mean another 100,000; and would bring the total college-level vocational training requirements of the economy up to something like 300,000 a year annually from now until 1960.

Supply of Trained Professional Personnel

In the academic year 1940-1941 there were 1.5 million college enrollments. In the last academic year, 1947-1948, there were 2.4 million, of whom 267,000 were granted bachelors degrees. In 1949 such degrees will be granted to at least 50 percent more students, and in 1950 there will be another sharp rise.

A large factor in the postwar expansion of college enrollments is the veterans training program. As these young men and women acquire their degrees and enter business and industriallife, we might expect some decline in college attendance. However, the indications are that no sharp drop is to be anticipated. Many young high school graduates are now postponing college entrance for a year or two, until some of the veterans' pressure is removed. At that time there may be a new postwar civilian pressure on higher education. And, of course, the new Selective Service Law may have a further bearing on the situation.

The President's Commission on Higher Education has estimated that the normal long-term trend would carry college enrollments up to 2.9 million by 1960. However, the Commission recommends that community policies and resources be adopted to provide higher education for 4.6 million persons by 1960. The Commission envisions that with such a program, there would be 2.5 million enrolled in the first two years of college, amounting to 49 percent of all young people in the appropriate age groups. They foresee also about 1.5 million enrolled in the last two college years--

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34 percent of the entire age group. And, finally, there would be some 600,000 more graduating from professional courses. Summing up all these estimates, it is evident that there would be, under such a program, as many as 750,000 bachelor-degree graduates, at least by the end of the period.

Our estimate of the purely vocational-training requirements of the economy are in the neighborhood of 300,000 annually, on the average. The present college enrollment is sufficient to supply almost all of this requirement, and the expected rise in the number of graduates during the next ten years should be ample to meet all professional needs. In fact, by the end of the decade, we should be turning out graduates far in excess of the combined needs of the professions.

Adaptation of Supply and Demand

While there seems to be in prospect in the long run a more than adequate supply of professionally-trained college graduates, this does not mean that there will necessarily be a well-adjusted relationship throughout all professions. For example, the glamour of atomic sciences and engineering may bring an excess enrollment of trainees in those fields. On the other hand, it is now becoming steadily more difficult to attract enough trainees to teaching, nursing, librarianship, and other occupations in which the salaries and prospects are not attractive. In other words, we may have a situation in which shortages may exist in some professions, while there are surpluses in others.

There is also a likelihood, as educational facilities and opportunities are provided, that there will be many thousands of young people who are trained for the professions but who will have to earn their livelihood in other occupations, such as clerical work, salesmanship, skilled work, etc. No matter how fast the professions may grow, they are unlikely to reach a level at which they could absorb all of the college graduates, if as many as one-third of our young people are to receive college training.

The effect will be to supply a large number of young people with college degrees for occupations which are below the professional level. This, in turn, may well have the effect of raising the qualifications of the labor supply in these fields, and, in turn, bring about a rise in employment requirements for jobs. One effect, of course, which has already been seen on past occasions, would be to depress wages and salaries in the white collar occupations into which these college graduates might flow.

Adjustment of Demand and Supply by Social Action

It should be evident that, if any such educational program is established in this country, there are some important policies which should accompany it. For example, the outlook strongly emphasizes the urgent need for improved vocational guidance. This is a subject on which much work has already been done, but it is also one on which much more work is needed.

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Clearly, it is imperative for the economy as a whole (to say nothing of the tragedies in individual cases) that our young people should select professions which are as closely related as possible to their interests and capacities. Every student who plans to use his college education, in part or in full, for vocational purposes should endeavor to make sure that he is on the right track. The misfits and their consequent maladjustment could create some major social problems in this country, if they are created on a large scale in a grandiose but misdirected educational effort. This means aptitude tests and vocational guidance for youngsters as early in the school career as is practicable. Something can be done even in the grade schools; much can be done in high schools; every college student should be given some attention. The successful choice of a profession by the vast majority of college students could be of tremendous value to the productivity and efficiency of our national economy.

The second factor of major importance is the establishment of a high degree of flexibility and adaptability in the professional labor force. Despite all miraculous foresight and every community effort, there are bound to be thousands upon thousands of young people trained for professions in which they will not readily find openings. Furthermore, there are certain to be technological changes which will make some occupations obsolete, while new needs are created. It will be necessary for the young professional man or woman to be ready to shift to alternate occupations, to switch careers, even at the peak of performance. It is urgently necessary that university training should be such as to qualify a person to make such shifts and to adapt himself to new situations.

Still another factor of great importance is the quality of training which these young people will receive. In the upward surge of postwar college enrollments it has been impossible for the universities to provide either the physical facilities or the teaching staffs necessary for the highest quality of training. I have no doubt that the very best that could be done is being done. The fact is, however that the future generations of college students should have improved teaching, improved libraries, better textbooks, and better opportunities for living. It is a question as to whether some of the teaching methods now in operation in the universities are to be completely discarded, while others that are now in experimental stages will have to be made almost universal. The challenge to the universities is the challenge to raise the quality of their training to a level which will warrant the expenditure of time and money by the students in obtaining a college education.

I have no harrowing examples to cite in college experience; perhaps some members of our panel can supply them. I can cite a dramatic instance from a high school from which my young daughter has recently been graduated. In this high school an astonishing proportion of the young students with an I.Q. of 130 or better were obtaining grades averaging "C" or lower. The teachers suggested that it was the fault of the parents. The parents were convinced that it was largely the fault of the teachers. Regardless of who is to blame, the fact is that the high school educational system was not bringing out the best in the most intelligent young people; in fact, perhaps it was bringing out the worst. In the universities it should be the objective to provide educational training which will stimulate the brightest minds in our Nation. This is the challenge to the universities in the field of professional training.

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WOMEN AS PROFESSIONAL WORKERS

NURSES - There are probably 20,000 nurses now engaged in direct war and defense work. Before the outbreak of war there were some 300,000 graduate nurses. There are more openings for well qualified women in nursing than applicants to fill them. The U.S. Public Health Service found in a recent survey that 20,000 professional and technical persons were needed in private and nonfederal governmental hospitals, and that this number may be doubled. It is also expected that the number of nurses needed by the Army and Navy will be doubled in the next year.

Types of work for which there is a demand include institutional nursing, teaching in schools of nursing, public health ~~nursingx~~ and industrial nursing.

Some types of personnel needed in addition to graduate nurses are nurses aides, dietitians, X-ray technicians, dental hygientist, medical social workers and medical record librarians, and various kinds of laboratory technicians.

For the college graduates who enters the nursing profession there is good opportunity to advance to administrative, teaching or supervisory positions.

....."We can be certain many nurses will be needed for the reconstruction days following the war." (Alma C. Haupt, R.N., Office of Defense Health and Walfare Services)

....."Not since 1917 has home economics been as important as it is today. There is a shortage of dietitians in institutions and hospitals. ~~Ixxxx

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It is said that all ~~xx~~ male physicians in this country 37 and under will be called to service in the armed forces.

Indications of future ~~xxxxxxxxx~~ opportunities for women physicians are, in addition to active practice, in such positions as consultants in industrial hygiene, directors of maternal and child health services and as directors of medical research.

Psychiatric social work has received tremendous impetus from the war, and it is a field of work which will expand even after the war. Five years of training after internship is necessary to become a psychiatrist. Case workers in psychi~~atryx~~ must base their training on a college education.

PHARMACISTS - Women are in every branch of pharmacy. They conduct pharmacies, serve as purchasing agents, in clinical laboratories and other capacities in practice of hospital pharmacy. In one state school of pharmacy predicts that women will be accepted as drug manufacturers' representatives and that women are in demand in drug and department stores, hospital laboratories, manufacturing plants and physicians' offices.

PHYSICISTS AND ENGINEERS

CHEMISTS,- metallurgists and specialists in explosives, plastics, rubber etc. are finding employment. An eastern college is urging girls to take physics, chemistry and mathematics as "war minors"-- Both the Army and Navy as well as industries are finding places for women with science degrees or ~~xxxxxxxxxxxxxxxxxx~~ academic ~~xxx~~ backgrounds in science. It has been said that the Army will need~~xx~~ 25,000 women in the field of radio alone, ~~xxxxxxxx~~

ENGINEERS

Women are needed as engineers. The Bureau of Ships is said to have asked for women engineers. Westinghouse Electric has selected its first woman, a graduate of a western college, to receive training in electrical engineering. In the communications field, both public and private, women engineers may be employed.

ECONOMISTS AND STATISTICIANS - The Federal Government is the largest employer of economists and statisticians. According to Civil Service there is increasing opportunity for women eligibles to fill positions in the various agencies. The junior professional positions for college graduates without experience is $2000. Other positions start at $2600. There is ~~xx~~ an unassembled examination of the open continuous type for economists, any specialized branch.

There are opportunities in industrial fields for this type of training as well as for women accountants.

The Civil Service has said it can place around 650 women economists this year if they have had training in accounting, statistics, commodities and markets, foreign trade, price analyses, public utilities, industry studies, consumer and population problems or crop estimates. Knowledge of one or more foreign ~~xx~~ lang. is an additional qualification on some of these jobs.

Those who are already equipped to handle professional jobs may be listed with the Commission's Roster of Scientific and Specialized Personnel. They should also take Civil Service, particularly if they have not already some experience to recommend them.

Many colleges and universities are offering tuition-free courses ~~xx~~ to college trained men and women who have a basic academic background and are otherwise eligible for employment in war industries. They are being taught a very wide range of professional subjects directly related to the specific needs of government and industry. It is known ~~xxx~~ as ENGINEERING-SCIENTIFIC-MANAGEMENT TRAINING.

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should also include paragraphs --
on social workers, psychologists, meteorologists, architects
the Red Cross + WAACs.

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Revised: (pp. 3 and 4)

4/22/44

Forum Meeting - "The Role of Business and Professional Women Today and Tomorrow"

Subject: Women's Contribution in Business and Government

A talk by Elsie Wolfe, Regional Representative of the Women's Bureau, U. S. Department of Labor, before the Missouri State Convention of the Business and Professional Women's Clubs, at 3 p.m., Saturday, April 15, 1944, Kansas City, Missouri.

A. Women's Economic Progress in the Past

B. Women's Contribution to the Present War Effort

C. Outlook for the Future

A. Women's Economic Progress in the Past

Did you know that there were at least two women in government service before the Constitution was signed? Mrs. Elizabeth Cresswell was postmaster at Charlestown, Maryland, under the Continental Congress in 1786-1787, and Miss Mary Goddard held the office of postmaster in Baltimore, Maryland, 14 years prior to the signing of the Constitution. Not only was Miss Goddard a government worker, but she was also a business woman -- the editor of the Maryland Journal and Baltimore Advertiser, during this 14-year period from 1775-1789.

There are few records that tell the story of women workers in the early years of our country. However, there is enough evidence to show that the progress of women in public service has roughly paralleled their progress in private industry. As they increased in numbers in private employment, their presence was accepted by public opinion, and also by government. In 1854, some of the "Ladies" employed as temporary government clerks copied the official papers at their respective places of residence, rather than to appear in a public office.

One of the arguments most frequently used by the advocates of employment of women by the Federal Government, was their lower wage scale and the resulting economy to tax payers. No one raised any questions about the fairness of this procedure and for many years a "female clerk" was synonymous with lower class.

Clara Barton, of Red Cross fame, is said to have been promoted from a copyest in the Patent Office, to a position of considerable responsibility and to have been given charge of one of the confidential desks. She held her copyest position throughout the Civil War, paying a substitute to perform her Patent Office duties while she served as a nurse at the battle front. The Patent Office salary however, was the only one she drew from the government during this period.

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Following the Civil War there was the usual reaction against women workers, even though they were very few in number. The periodicals of the day echoed this attitude. In the November 9th, 1867 issue of the New York Round Table Magazine, the following quotation was found:

"The profession of teaching is sympathetic to womanhood and gives a worthy occupation to the mind, but the task of female copyest in the departments, and the quasi-factory duties of the girls in the printing bureau are of a far less elevating character and produce rather a bad than a good influence."

Three inventions[1] around the middle of the 19th century opened up entirely new occupations for women -- occupations which today women practically monopolize. These inventions were the telephone, telegraph and typewriter.

With the establishment of the Civil Service Commission in 1883, and its introduction of competitive examinations, women gained a chance to demonstrate their proficiency in a concrete fashion by taking the same tests as men. By 1902 the Civil Service Commission was unable to supply departments with qualified men stenographers, therefore they were forced to accept more women. Private business had gone far beyond the Federal Government at this period in hiring women stenographers. It is said that women constituted 75% of all the stenographers in private business in 1902.

In 1910, one of the largest railroads[2] announced that it would hire no more women stenographers, clerks or telegraph operators. The railroad supported its action by declaring that its statisticians had discovered women stenographers did 30% less work than men. Today this company has one of the most liberal policies toward women. In the same year the Civil Service Commission announced a stenographic examination for men only. These movements to get rid of women in office work, are themselves evidence that by 1910, women had made so much real progress in both private business and government service that they were beginning to attract attention.

The first big impetus to women's employment came with World War I. The gains of women in the clerical field were consolidated and publicized by the war. In almost no work of this type was their ability again questioned, but in the higher paid and more desirable occupations, the war gave women few real or permanent foot-holds -- However, the war did give women the right to vote. During the depression, as you know, both government and private industry took drastic action against the employment of married women, particularly office workers. In many companies women who married while in their employ were automatically dismissed. The famous Section 213, of the Economy Act, worked hardships on many women in government service.

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[1] Date of inventions: (Source - Columbian Encyclopedia)
A. First commercial typewriter in United States - 1867
B. Telephone - 1876
C. Telegraph - 1844 (First line)

[2] Baltimore and Ohio Railroad

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B. Women's Contribution to the Present War Effort

It is still too early to measure the full extent of women's part in our present war effort, but as a representative of the Women's Bureau in the United States Department of Labor, I want to pay a sincere tribute to the 16-1/2 million women workers in our country -- for their very real and valuable service in many fields -- including the women who are running their husband's business while he is away at war.

The women on production jobs have been more publicized than the office workers, but we must remember that production cannot be accomplished without the aid of the "white collar workers". Did you know that in most of our large war plants about 50% of the total number of employees are in Supporting Departments -- that is, departments not in actual manufacturing?

Many additional opportunities for office work have opened up to women -- jobs that were once filled by men, such as accounting, bookkeeping, bank tellers, office managers, and other administrative positions. Insurance and real estate companies are now using many more women in the higher paid jobs.

Transportation companies have not only been admitting women to most jobs, but have been actively recruiting them to replace men. The Civil Aeronautics Administration and commercial airlines today readily accept women on the same terms as men and have given them interesting things to do from traffic managers to tower control operators.

Although railroads are employing a larger number of women than any other transportation branch, air lines have a higher percentage of women. In October 1943, women railroad employees ranged from a high of 13.8% in some companies to a low of 2.8% in other railroads. Out of the 88 types of jobs open to women in railroads today, probably only ten or twelve would interest the women in this audience as offering a future. Among these are auditors, accountants, legal counsel, traffic managers, traffic engineers, draftsmen, and designers.

In January of this year there were almost 1 million women in Government Service in full salaried and wage groups, out of a total of 2-3/4 million. Thus, women were occupying approximately 30% of all Government jobs -- the highest percentage in the history of our country.

The tremendous increase in the number of stenographers and typists employed by Federal agencies, was the most sensational part of a general expansion of personnel which was required to take care of the vast project of the defense and war programs. Nurses constitute the second largest group of Government workers.

The Army and Navy Departments employ more women than any other Government agency -- or any other War Industry. Besides the women serving with the Armed Forces, there are civilian employees in our many Government Arsenals -- not only office workers but industrial workers making fleece-lined suits for pilots, gas masks, parachutes, and ammunition.

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In addition to the War and Navy Departments, many other agencies are employing women in large numbers; Selective Service has thousands of women enrolled in the local, city and state offices, checking the questionnaires of men who are being called to war. The Treasury Department, also has thousands of women speeding the sale of war stamps and bonds.

College trained women are being sought in ever increasing numbers to fill war jobs in the Government. It is estimated that there are approximately 3,500,000 women in America who have either received college degrees or have had one, two or three years of college training. The Civil Service Commission recognizes the importance of this vast reservoir of trained womanpower. These college women are serving as dieticians, social workers, dental hygienists, doctors, lawyers, economists, personnel officers and in many other capacities. It is difficult to ascertain in what professions they are working in the largest numbers, but critical labor shortages have developed in engineering and physical sciences, in management and administration, in the social sciences, and in the fields of accounting and medicine. It is more and more imperative that professionally and technically trained women take war jobs in which they can utilize their high skill and talents.

As you know the Secretary of Labor, Miss Perkins, holds the highest type of job of any woman in government service. There are five other women who hold positions as heads of bureaus with salaries of $7500 to $9000. These women are Mary Anderson, Director of the Women's Bureau, Katherine Lenroot, Director of the Children's Bureau -- both in the Department of Labor -- Nellie Tayloe Ross, Director of the Mint, Lucile McMillin, Civil Service Commissioner and Ellen Woodward, the only woman member of the Social Security Board. Among women who are serving their government in this critical period is your own Margaret Hickey, the important and able Chairman of the Women's Advisory Committee of the WMC. Another is Mrs. Snoddy, Civil Service Commissioner in this region.

C. Outlook for the Future

I am sure that all of us here today are interested in the outlook for the future. Will women have greater opportunities to hold outstanding positions and to mold policies affecting the interests of the women than in the past -- than in the present war period? If not, our society will not have made much progress.

Did you know that in 1940 there were 5,300,000 women who were heads of families, according to the Census Bureau? If there were over 5 million women carrying such responsibility in 1940, how many do you think there will be in 1950? How many do you think there are now?

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There are some would-be planners who have a quick and simple solution --"women will return to the home" they say. A letter received in the Women's Bureau recently is a good illustration of this attitude. It came from a young man. In writing about his industry he ended the letter as follows: "Wishing you success in your work and hoping for the day when women may relax and stay in her beloved kitchen, a loving wife to some man who is now fighting for his beloved country". Some of the industrialists and economists express the same viewpoint only in different words.

Fortunately, other authorities concerned with the transition from a war to a peace time economy take a more realistic approach. They see the value and need for planning a peace time economy which does include women workers. President Roosevelt stressed the right of every American citizen to gainful employment.

No one questions the right of women to work when there is a labor shortage but when jobs are scarce women workers suddenly become less efficient -- according to the men -- and "their place is in the home". When the economic pressure lets up and the employment situation eases, women are always accepted as workers, indicating that women's progress in both business and government is controlled by the economic need for workers.

Mr. John Durand, from the Census Bureau, estimates that if the war ends in 1945, there will be 15,000,000 women having or wanting employment during the reconstruction period. He says, "Such a supply of labor is a challenge to American industry and government. If full employment can be attained by providing jobs for all who wish to work rather than by discouraging the employment of women and trying to cut down the labor force, the expansion resulting from the war can mean greater prosperity than the nation has ever known. To this end the need to provide jobs for a much larger number of women should be recognized in the plans which are now being made to maintain employment in the post war period."

The Women's Bureau is in complete agreement with this idea. We know from our 25 years of study of women wage earners problems, that the vast majority of women workers seek employment from economic need. A policy to be woven into the whole picture is the equal pay standard for women, i.e., wage rates should be based on occupation and not on sex. Many gains have been made in this respect during the war, but much greater gains must be made to keep the double wage standard from undermining our postwar employment program and economy.

Concerning office jobs opening up to women because of the war, the general office manager of a large industrial corporation has this to say: "I believe there will be plenty of room for women even after the men are discharged from the services. Quite possibly we shall be happy later on, that during the war we did develop woman-power in our offices. In general women who had unusual opportunities during the war, in their chosen field, will not be shut out in the future. It seems safe to predict that many women who have performed with outstanding success will be retained in spite of male competition. The success of such women will create a growing demand for others in the new economy which we hope to achieve."

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Miss Ruth Leach, Vice President of the International Business Machines Corporation, made this statement: "What I believe women want in the post war world is not to keep those jobs, but the freedom to keep them. What women should strive to retain is a freedom of choice". She believes that women should have a chance at the top jobs and that it is a matter of sound business policy to have in management, a substantial number of women whose impressions, reactions and emotions are more like those of the majority of the customers who are women. She further stated that women would bring into the organization fresh thoughts and ideas. They can add new attractiveness to new products. They can soften and strengthen human relations.

Mary Anderson, our Director, believes that a much larger number of highly trained and competent women will have leading roles on the national and international stage. The number has been deplorably small to date. All this suggested participation by women in the winning of the peace, cannot be achieved by optimistic prediction, wishful thinking or faith without work. Therefore, the Women's Bureau is not only giving specific study to possible post war developments for women workers, but is urging women's organizations to assume a share in educational efforts along these lines. Such organizations -- national and international -- are already giving thought to these matters. But they should see to it that qualified women are included on the various planning committees, whether set up by industry, labor or government, whether on the local, national or international level.

Women have barely begun to use their powers as American citizens. We have in this country, many able and well-trained women who could and should serve in state legislatures, and the Congress of the United States, just as well as in government positions on the policy making level.

Have you noticed that there are five women in Illinois who are now candidates for Congress, and 14 women aspirants for posts in the State Legislature? If this can be done in Illinois, why not in Missouri? I believe Missouri has only five women in the State Legislature.

Women have certain special contributions to make, somewhat different from those of men -- women are more vitally concerned with the welfare of individuals and the family, with protecting the weak, helping the needy and settling difficulties in the field of human relations.

The challenge to American women today is greater than ever before -- to become better citizens in our own democracy, and better citizens in the world. I believe that they will do their part if given the chance to make this world worth all the blood and grief being paid now as the price for a free tomorrow.

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MVR
Joan copy

MATERIAL CONCERNING THE RANGE OF SALARIES FOR WOMEN EXECUTIVES

There is very little material on this subject. The National Federation of Business and Professional Women's Clubs in a report on their own membership for 1941, gave some information about the managers and officials included, whose jobs were quite varied and hard to group together. They reported that their managers of retail stores had median earnings of $1,370; office managers of $1,725; and restaurant and hotel managers of $1,423. Further correspondence with this organization at 1819 Broadway, New York 23, New York, might give additional material.

The Women's Bureau prepared a brief report on some women in personnel and industrial relations work in war industries, but with little data as to their pay. The cases of women in such jobs were quite scattered.

The Bureau of the Census has reported 1939 wage or salary income in various occupations. These reports include some 54,000 women as proprietors, managers or officials. They show that in the year less than 7 percent of them had received as much as $2,000; however, this signifies very little because those of this group who were proprietors or members in a partnership would receive additional funds that would not necessarily be reported as a part of wage or salary.

In recent studies the Women's Bureau has made of the outlook for women in various medical professions there is some indication as to earnings possibilities for that small proportion of such workers who would enter the administrative field. (Bul. 203-1, 2, 3, 7, 8)

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WOMEN IN SUPERVISORY AND PERSONNEL

Mrs. Helen Becher - Counselor, West Yard, Moore Drydock Co. Oakland, Calif.

Miss Jeanne Butcher- women's counselor - East Yard. Moore Drydock Co. Oakland. Cal.

Mrs. Mabel Peterson - women's counselor - Yard #2 Pacific Bridge Co. Alameda. Calif.

Mrs. Marion Anderton - Recruiting - Marin Shipbuilding Corp. Sausalito, Calif.
Miss Ethel McCarthy - Coordinator- training Division (ditto)

Sarah Rehling - women's coordinator - Labor Relations Dept., Richmond Shipyards, Richmond, Calif.

Mrs. Jean Hanson - women's counselor - Richmond Shipyards #1 Richmond, Calif.
Miss Madyln E. Holmes - expediter - women - Oakland Ave. Richmond Shipyards

Mrs. Addie B. Bishop - Industrial Relations and Personnel Asst. coordinator between the women, the masters in the shops and the Navy Mare Island Navy Yard

Miss Priscilla Crane - asst. personnel mgr. Peck, Stowe & Wilcox, Southington, Conn.

Miss Katherine Minor - women's counselor - Connors Plant, Briggs Mfg. Co. Detroit, Mich

Miss Doritha Lanctot, Dir. of Women's Activities, General Steel Castings, Granite City Ill.

Mrs. Anna Woodward - women's personnel supervisor - Imperial Rattan Co. Ltd. Stratford, Ontario

Miss Renée B. Kimmich - Asst Safety Engineer Air Corps, Hdqts. Boohley Field Mobile, Alabama.

Mrs. Winifred M. Ryan - Female Asst. to the Chief Inspector - Chicago Ordnance Dist. Peoria Sub Office - Commercial Merchants Natl Bank Bldg. Peoria, Ill.

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ENGINEERING AND ALLIED PROFESSIONAL WORK

Mrs. Mabel McFerran Rockwell, Production Engineer, Lockheed Aircraft Plant 408 S. Spring St., Los Angeles, California.

Miss Mary Elizabeth Miller, Engineer, Glenn L. Martin, Baltimore, Maryland.

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Other Laboratory Workers

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ENGINEERING & ALLIED PROFESSIONAL WORK

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ADDITIONAL WOMEN IN ENGINEERING & ALLIED PROFESSIONAL WORK

Chemistry

Miss Marion E. Maclean -- At National Bureau of Standards, Washington, D. C. She is studying the chemistry of lubricating oils used in all types of machines in an effort to measure the acidity developed at high temperatures.

Engineering

Mrs. James Bonner -- Assistant maintenance engineer at the Southern Friction Materials Co., Charlotte, N. C. She graduated from Huntington College, Montgomery, Ala. Had no engineering experience except that picked up from her husband who is now in the Army.

Miss Elsa Gardner -- Associate aeronautical engineer, at the Bureau of Aeronautics, U. S. Navy. She is the only woman aeronautical engineer with the Navy. During her college days she worked with the British Ministry of Munitions in New York City. She has written extensively. Has worked for the Eclipse Aviation Company, the Wright Aeronautical Corporation, and the Army Air Corps as editor of Technical Digest.

Mrs. Catherine L. M. Insinger -- She installs machinery on Government ships and heads the Insinger Machine Co. of Philadephia, at 6245 State Road. When her husband died in 1918 she knew nothing about his business, has now mastered every detail and made many improvements and additions. Has installed the big dishwashing, and potato peeling machines on many ships.

Mrs. J. D. Pickard -- is taking over the chemical laboratory at the Southern Friction Materials Company at Charlotte, N. C. She was a Phi Beta Kappa at Duke University, excelling in chemistry.

Miss Virginia F. Reilly, Easton, Penna. The first woman to complete the special course in ship construction and hull drafting at Penna. State College. She is a graduate in architectural engineering and has been employed in the design section of the industrial department of the Philadelphia Navy Yard.

Research on metals durability

Dr. Hertha Freche (Ph.D.). She conducts research tests on metal's durability at the Aluminum Company of America, New Kensington, Penna. Her studies have resulted in new methods of stamping which prevent tearing, and hold down the percentage of scrap. She graduated from the University of Minnesota and taught for ten years, and is married to a professor at Pittsburgh University.

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UNITED STATES DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

WOMEN IN THE PROFESSIONS

From "American Women", 1937 - 1938 volume.

Born 1837 or earlier,	76	80 years and over	1.0
1858 - 1867	299	70 - 80 years	3.8
1868 - 1877	804	60 - 70 years	10.3
1878 - 1887	1,229	50 - 60 years	15.7
1888 - 1897	1,416	40 - 50 years	18.1
1898 - 1907	907	30 - 40 years	24.4
1907 - 1922	124	15 - 30 years	24.5

Occupations represented by 50 or more women:

Actors	183	Executives, chiefly bus personnel	245
Arts, Total	515	Government, Total	241
Art Education	57	Federal Officials	113
Painters	100		
Sculptors	54	Library work, Total	440
		Librarians	375
Attorneys	254		
		Music, Total	329
Authors	516	Composers	69
		Instructors	65
Chemists	58	Singers	89
Editorial Work, Total	333	Organization officials	117
Editors	166		
		Physicians & surgeons	196
Education, Total	2,227		
Asst. prof.	228	Poets	58
Asso. prof.	234		
College deans	310	Psychologists	91
College Dept. heads	138		
Educators (general)	401	Researchers	109
Instructors	127		
Professors	405	Scientists	51
Teachers	121		
		Secretaries	62
		Sociologists	118
		Writers	929

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UNITED STATES DEPARTMENT OF LABOR
WOMEN'S BUREAU
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EARNINGS OF WOMEN COLLEGE GRADUATES IN 1934, BY OCCUPATION

(From survey of members of American Association of University Women)

Occupation	Number of women	Average (median) year's earnings
Total	7,667 1/	$1,676
Physician or psychiatrist	43	2,708
Personnel administrator	121	2,382
Educational executive	1,079	2,190
Home economist	185	1,920
Research worker	170	1,838
Office manager	66	1,792
Trained nurse	47	1,716
Teacher	4,315	1,642
Librarian	427	1,598
Social, health or religious worker	385	1,421
Secretary	273	1,278
Editorial worker	60	1,267
Independent business	157	1,145
Clerical worker	200	923
Sales, advertising and publicity	66	891

1/ This total number of women reporting on earnings includes 73 in professions other than those specified, the number in each being too small for the median to be computed.

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Women's Bureau
U.S. Department of Labor
Washington

WOMEN IN SPECIFIED PROFESSIONS

Women Engineers

Engineering is not likely to come to mind when a discussion of occupations for women is under way. Yet they are getting more than a foothold in almost every phase of the field. Ethel H. Bailey, herself an engineer, writes of their work in Independent Woman for September (1932).

Olive Dennis, engineer of service for the Baltimore and Ohio Railroad, is a civil engineer and a graduate of Cornell. She entered the employ of the Baltimore and Ohio Railroad as a draftsman. Some fourteen months afterwards she was transferred to the President's office and today is responsible for the many innovations in the dining cars of her company, the little individual ventilators at your coach window and other devices which are perhaps little noticed by the ordinary traveler but means so much in comfort.

It was a woman engineer who saw the possibilities and worked out the illumination of Piccadilly Circus in London.

Margaret Ingels has been associated with the traffic department of a large telephone company and has served with the New York Commission on Ventilation.

Dr. Lillian M. Gilbreth is without question the best known woman engineer in the world. Her field is industrial engineering and her specialty motion study. Her writings concerning household management have had very wide influence.

While engineers are not, all things considered, a well paid group the salaries of women are commensurate with those received by men in the same type of position.

Miss Bailey agrees with Dr. Gilbreth who says, in regard to women in engineering, "So far very few women have gone into the field partly because it is demanding, partly because of the mistaken idea that women are not wanted or welcome in the profession. So far as this country is concerned, the women in the profession have had only the most kindly and cooperative treatment from the men in the field, and have been given every opportunity for training, for advancement and for participation in all of the activities of the profession."(Women's Work and Education,Oct.193

Air Transportation

A study made in 1931 by the Bureau of Labor Statistics was published in the Monthly Labor Review, August 1932. The study was limited to pilots and copilots on scheduled mail and passenger routes and to the general personnel used in the operation and repair of such machines. It is interesting to note that while the study covered approximately 95 percent of such workers, 3,509 were men and 88 women. The women were employed as traffic agents, clerks, stenographers, secretaries, fabric workers, and in small numbers in other fields. For all men employees, average actual earnings for one week were $31.89; for all women, $23.85.(Women's Work and Education,Oct.1932.)

Bank Positions

Thirty-six hundred important banking posts in the United States are now filled by women, according to Miss Grace S. Stoermer, assistant vice president of the Bank of America of Los Angeles. These posts range from president down to head of a minor department. (Christian Science Monitor, March 11, 1931.)

Department Stores

Women are developing so much ability in department store work as a career that a large Brooklyn N.Y. establishment has instituted a vocational course along this line for a selected group of 35 seniors of the Erasmus Hall School... The fact that two of the largest department stores in New York City have recently each appointed a woman from the personnel of the store to the office of vice president has put the opportunities for advancement in this line of work much in the foreground of vocational interest. (Christian Science Monitor, August 11, 1931.)

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Extract from an article entitled Social Work Against a Background of Other Professions, in The Compass, May 1932.

The following article contains in somewhat condensed form the main argument of a paper given by Esther Lucile Brown at a Joint Session of the American Association of Social Workers and Division XI of the National Conference in Philadelphia. Dr. Brown has recently made a survey of a number of professions including social work, medicine, law, dentistry, nursing, teaching, the ministry and engineering.

.....

In comparing social work salaries with those of the other professions, the most fundamental difficulty lies in the fact that there have been altogether too few comprehensive studies of salaries within the social work field. Interestingly enough, doctors, dentists, nurses, and engineers have all made extensive attempts since 1925 to examine their financial status. The National Education Association continues its biennial survey of teachers' salaries. Within the next few months the ministry will publish the first extensive information concerning the salary level of the clergy. Since social work, unfortunately, has no comparable data, one can only estimate the median salary. If the statistics of the Joint Vocational Service are indicative of salaries throughout the country, the median is between $1800 and $2000. From a computation based on the study of 6326 random reports of physicians from all parts of the United States, the median gross income for 1928 lay in the range between $6500 and $7500. The median net income was probably somewhere between $4500 and $5000. From 5,544 schedules which dentists contributed from twenty states, the average gross income in 1929 was $8279 and the average net income was $4911. It should be noted, however, that these figures represent arithmetic <u>averages</u> and are somewhat higher than the medians would be. It probably gives a fairer picture if one bears in mind that the most frequent net income was $3200. When the mechanical engineers evaluated the 1930 earnings of their group throughout the country, they excluded teachers of engineering and employees of the Federal Government whose salaries would have somewhat depressed the average. According to their survey median beginning salaries are close to $2000, reach $4000 when a man has been out of the engineering college ten years, and $6000 at the end of eighteen years. During the period of thirty to forty years after graduation, median salaries reach their highest peak, which is a little less than $8000. Thereafter they decline, but slowly. Since about ninety per cent of engineers are on a salary basis and not in independent practice, the above figures very largely represent net income.

For the three preceding groups, average salaries are considerably above those for social work. Let us consider the situation in teaching, the ministry, and nursing where the rewards are considerably less than in medicine, dentistry and engineering. In 1927, according to the National Education Association, the average salary of teachers, supervisors and principals in elementary and secondary schools was $1252. Averages varied enormously from New York State which led the list with $1986 to Mississippi at the end with the pittance of $448. Inasmuch as the average salaries of teachers are decidedly influenced by large ~~cities~~ rural sections, it seems only fair to consider salaries paid teachers in medium-sized and large cities where most social workers are found. In 1930-31 in the 204 cities with a population of 30,000 to 100,000, the median salary for elementary teachers (exclusive of supervisors and principals) was

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$1609, for junior high school $1860, and for senior high school, $2111. In the 88 cities of over 100,000 population the figures for the three respective groups were $2118, $2348, and $2731. There has been little definite information concerning ministerial salaries. The Methodist and Congregational Churches are the only ones which have kept continuous salary records. In 1926 the average for these two denominations was $1826. If the forthcoming study of the clergy reveals a median salary below that figure, one must remember that the situation is almost identical with that of teaching. The minister in the rural section does not receive a living wage, but his actual salary is frequently supplemented by free rent and gifts. The urban minister may likewise receive free rent, but in addition, his salary is more nearly comparable to the standard of living which he must maintain. Finally there is the nursing profession. The private duty nurse seems to fare worse than anyone else. Although she earns forty-one dollars a week on the average case, she spends an aggregate of five months in twelve out of work, according to a study by Dr. Burgess. Moreover, she continues from year to year at an almost even level of pay. The median salary for the private duty nurse (exclusive of board and room which she may receive while on a case) is only $1297. The public health nurse comes off considerably better with $1685, and the institutional nurse better still with a median salary of $2000. (The last figure was computed on a cash-received basis and then increased by $500 to cover the maintenance which institutional nurses almost always receive.) The evidence which the figures for the three fore-going groups sets forth, seems to indicate that on the average social workers are not yet receiving as much as teachers, probably no more than urban ministers, and scarcely more than the nursing profession. The facts suggest that social work needs to continue its vigorous attack on salary levels, if it hopes to offer remuneration at all comparable to most of the other groups.

MEP:rfh 1-17-33

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Interior Dept. Mrs. Gertrude O'Newil---given meritorious promotion for a suggestion that will save tons of paper

Adjutant General's Office--Mary Lou Tucker rewarded for saving taxpayer the time of three clerks for recommending a simpler method for handling correspondence. ---preparing Purple Heart certificates

Mrs. Fanny W. Yeatman--author of the popular book "Aunt Sammy's Radio Recipes now recently retired from the Agriculture Department. In the last war she popularized corn meal for the wheatless days, in this war she has sought a wider use of soya recipes.

Dr. Lenose Sater--U. S. Department of Agriculture making a survey of substitutes for aluminum

Women at Work in the Government Service

Navy Dr. Avis Borden ---At the David Taylor Model Basin in Maryland where Navy experiments with new ship designs and tests scale models of both Army and Navy caraft., structural mechanics division developing methods of calibrqtin uns under water expolosion gages. degree in physics from U of Michigan '38---

Navy A. Axon G. Irish--of the Naval Ordnance Lab at the Wash Navy Yard Women physicists and engineers in Acoustics and Sp. Problems Divison Narragansett Bay worked on water fron in a trailer claboratory-- for offshore tests the Army had to take them to sea in C. Artillery boats

~~Dr. Mary E. Pennington--Quartermaster General's consultant on food handling~~

Mrs. Songer. Bu. of Standards

captive spiders - reels of unfinished fine silk thread, spun by Black Widow secured to cushion of yucca wood. May, Independent woman

Common

Jetter 6-28-44

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executive jobs formerly held by men
fully trained
pres & pub util

3258 W holding licenses

Aviation
directly traffic, air control
& light maintenance

specialty
Bros directly wood guy '16. men

Railroads – hitch offices reformed
Brothers

Q top ranks artists stage & screen donate
service

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Hard to know which w. w was effort —
w. as employee — w. as volunteer —
of employing w. — diff ~~[illegible]~~ draw line
~~diff~~ ~~[illegible]~~ all felt pressures & most carry w.
work for w. — w lab. front — production
1st time — unions — made wonderful contrib
stressed
Top workers — social workers — technicians
war dept supply depts
Govt offs & private school
Rep of industry others can do
act consult to govt —

Others behind scenes — unobtrusively
Clerical workers — sec, stenog, typists
file clerks —
Govt & private school
~~H Printing & business~~
Bus. Transportation — public util
advertising
Tel. & Tel.
Aviation *
Travel offices
Profess. w. — Industry business welfare (advertising
Lab — industries / pioneers
blazing trails
U.S.O. —
W. transfer one field to another
actors — artists — (same game
carry w. husbands
to
Medical
newspapers
Small business w.
Garment — safety clothes
W. on farms —
Much more can do

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Top Mechanics

Gen. Multiplied many times

Regular officials administration
labor, health, welfare
w. Congress. bill. Mines
w. safety practices

Consultants

Rosenberg - lab. problems
Stowers - N.Y. City dep. Sta
General
Cornsott
quartermaster general
Gray Barker - Interior
Dept

Mrs. Jerrine Blair
Consult. - safety
Gov. ships & docks

Chase Going Woodd
author, editor &
Pres. of Bonds. w

Pennoyer

Mrs. Julian Heaviches
Builds models of
ships.

Anna O'Hara McCormick
reporting news
so well - award

Timothy Schuff

Mrs Geo. Baker Clem. Policy
N.Y. Post

Alma Heflin
test pilot
aircraft

Mr. Farron -
Produced engineer
Westwood airforce
pilot

Ely Culbertson.

Norma Talmadge.

Ruth Elder

Florence Fleischer
female mechanic

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Of these women participants in the war drama, the spot light of publicity has occasionally been focused. But the great majority are working inconspicuously and effectively behind the scenes to keep the wheels of industry turning and all other aspects of the war program moving steadily forward.

Working directly with the armed forces — behind the lines of battle, and in the cantonments here — are thousands of women — nurses, social workers, technicians, physiotherapists, service workers. The greatly increased number of women in the Federal Government to help promote the war activities has been frequently played up in headlines. Most of them are clerical workers, many are on industrial jobs, some are in professional positions. Comparatively few are in top-ranking positions, but are concerned with health, welfare, industrial matters for the most part. In the limelight recently have been these women responsible for the setting up of the first Women's Army Auxiliary Corps in our history.

A few outstanding women are making important contributions, serving

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as consultants, in such fields as labor problems, merchandising, army feeding, selling war surplus, disposal, difficult nature of women's abilities, as related to the war program.

In private enterprises a few women have reached pinnacles affording them spectacular opportunities of achievement in war service. Among the several in key engineering jobs is one as personal director of a great industrial plants; there are women test pilots flying bombers from here to England and as now having a group of American women to ferry bombers. — a woman architect who makes models of ships — the woman president of a company manufacturing cable grips used on battleships. — a woman journalist.

The number of women in industrial positions is gradually growing, and there are thousands of women in production lines, making planes, shells, tanks are employed, safeguarding and performing themselves adequately and efficiently in types of work considered right for the women. Most (alien and colored workers) — Dr. — School of Free enterprise mechanics

The women with training and experience in the fields of work, physics, chemistry, who have entered industrial laboratories as pioneers

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Women's contributions to the war effort are still in the making, are so varied and widely scattered, and in most instances so unobtrusive, though none the less effective that a true over-all picture is not yet available, when it is, women's vital share in the fight for victory and democracy will constitute a ~~heroic epic of modern national history~~ ~~already the exploits of~~ women's services in the farflung theatres of war in the battle of production and other sectors of the home front, as well as in the ranks of the volunteers are the real of the wonderful ~~of women in war~~ quite phase.

In fact, of the 13 million or so women now employed, it is difficult to draw hard and fast lines of how many are really in the war effort. Practically all are ~~doing war roles~~ necessary to the nation.

We are told that something like a million and a half women are in "war employment," ~~which multiply accounts~~ ~~was~~ ~~manufacturing~~ for war purposes, a percentage of ~~transportation~~ and public utilities, and certain governmental activities,

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We are told "that something near
1½ million women are gainfully employed".

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to replace men called into the armed forces have blazed a trail, which promises to be trod by increasing numbers of women in increasing months. The same is true >

Women's adaptability to war work all along the line has been a source of great satisfaction to them as well, and of amazement for men. Hundreds of women electricians ~~[illegible]~~ are the practical for their husbands called into ~~[illegible]~~ armed forces.

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for women as ~~time~~ the field of bombing,
as business executives, a woman

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In the overwhelming drama of the war the quiet but none the less effective roles of the housewives and professional women has not shared the limelight with the more spectacular roles in a quiet but none the less effective fashion she has been rendering valuable service. She merits high tribute for the contribution she is making, as yet the full story of her sacrifices and achievements in the defense of our democracy is not available. But the fragments that come to the attention of the public are quite stirring in the progress of women and symbols of their usefulness to the Nation in this acute crisis.

Much has been written of how industrial women have stepped into the breach in the battle of production. Some attention has been given to the women office workers who have worked so indefatigably behind the scenes to help keep the wheels of industry turning. The women with technical training have been wholeheartedly entering doors formerly closed to them and efficiently entering one the tasks to which they are called, too

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private industry or into public
offices to enter the places of men,

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Business women who turn their own factories or shops are converting their enterprises to the war effort, and carrying on courageously.

Some women deserve credit for pioneering into male work as laboratory chemists - physicists - engineering aides - blazing the trail for others. Industrial leaders who until recently frowned on & refused to take women applicants are now finding them surprisingly good.

A few women deserve credit for taking a job at any level and working their way into a professional job for which really qualified.

Some are top notchers & commend for their services - inventing new products.

Some dollar-a-year women

Women in making garments
safety clothing

Ingenuity

Take a [illegible] woman who received area award for improvement for work

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Women have been talented — of free of [illegible]

makes trial sold some considerable material

Enterprise —

Consultants (Mrs Lorena Z. Blum
founder of Women's Press Club
of America
addresses large audiences
of women on subject of
[illegible] — She [illegible]
[illegible] called her for the
[illegible] to conduct
a [illegible] class among women
leaders of Capitol

a woman who succeeded her husband
as city editor.

all woman newspaper staff

Stage, Screen
Top-rank artists of stage & screen
donate their services to Red Cross war
work

Relief for [illegible] Belgian & Belgium (Women
switchboard
operators

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W - pres & pub — ~~Times~~ Mrs Geo Boeing

Test pilot - aircraft mfrer

Instruction

Aircraft short of carrying arms

Raising money

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aircraft - bazooka & [illegible]
[illegible]

war industry
war mfg
clerks
process
get people

REPRODUCED AT THE NATIONAL ARCHIVES

Kathleen Crom – auto partsbr. when
Women in informal birth Pa. State
1st time in 25 yrs

Strong recognit. of his abilities
Dr P.W. re
his organizat: – in company

Achievements point to great value of an
all-out use of women's abilities, talents, services

1/3 small, in – employed.
actual real 1/2 in. in bus & fort.
Great bulks of these in Mfg –
In product lines –
Chess Woodhouse

USC | Terry Plemes in Bnd

N. journalist (for distinguished services
(award from to humanity Anne O'Hare
Natl Inst of Social Sciences) McCormick

REPRODUCED AT THE NATIONAL ARCHIVES

Dorothy Stover - med pres. of a my city
dept store - applied as general consultant
in merchandising to the Office of the
Quartermaster General (only proof of
the capacity of women for large scale
~~production~~) organization
builds models of ships

Mrs Lillian S. Hodge, pres of Harmat
Hubbard Ayer Inc,

Mrs Juliana Deseck - builds models of ships
architect & shipbuilder

Advertising

Medical moves what was

Hereby traffic in air & rocket
flight instruments

Supt Bureau - 14 mm working office & apparatus

Where began to end

Models about ut end

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Women's contributions to the war effort are still so much in the making and are so amazingly varied and widely scattered, ~~and so [illegible] instances so [illegible], though [illegible] effective~~, that a complete over all picture, is not yet available. When it is, women's vital share in the fight for victory and democracy will shape up into a heroic epic. This is presaged by the many vignettes of their achievements during recent months. Their services in the far-flung theatres of war in all sectors of the home front, among the ranks of the volunteers emphasize women's all-out response in this acute crisis of our nation.

There are million and a half women are said to be in war employment, a term covering all manufacturing for war purposes and a percentage of transportation, public utilities, and governmental activities.

~~Some~~ of these women participants in the great war drama, ~~have~~ been headlined and

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spotlighted for their spectacular performances. But the vast majority are working unspectacularly and indefatigably behind the scenes, to help keep the wheels of industry turning and the many other activities — ~~[illegible]~~ — moving steadily forward.

Serving directly, and often heroically, with the armed forces — behind the lines of battle, overseas, and in the cantonments here — are thousands of women as nurses, social workers, technicians, and so on.

Their ~~army~~ the constantly growing numbers of women in government war work are found ~~their~~ very useful army of secretaries, stenographers, typists, file clerks. ~~Many~~ Other thousands are ~~[illegible]~~ engaged in industrial, mechanical, and professional pursuits essential in the Government's emergency program.

A few women are functioning effectively in top-ranking Federal positions, engaged chiefly with matters of health, welfare, and production as related to the war. Credit ~~[illegible]~~ must be given to those women responsible for initiating

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the first training Army Auxiliary Corps. Good honorable mention should be made of the women experts in private fields serving as consultants to the government in its war needs such matters as labor problems, merchandising, Army feeding selling war stamps and bonds, utility of manpower, for example.

Turning to private enterprises tied in activitely as the government in the war effort we can parallel women's endeavors as to occupational achievements and use of their talents. A few women have reached more phenomenal pinnacles in the industrial realm. Consider the few women who in the lime light be- ~~fore~~ holding down jobs as engineers, executives, personnel directors — the leading aviatrix who flew a bomber to England and as many as there training 25 other American women for ferry duration since — the woman architect who makes makes ~~ship~~ models — the president of her own company manufacturing cable cups for battleships — the woman journalist recently ~~a~~ — Or consider the enterprising women trained in mathematics, physics, chemistry who

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have plunged trends as pioneers into the laboratories of war industries taking the place of many inducted into the armed forces, and because of their quality experience were able to penetrate up onto jobs of such types to women.

Again and again tribute should be paid to the constantly growing thousands of women in our production lines helping to make planes, guns, shells, tanks, uniforms, shoes, and an endless variety of fighting equipment. And we must not overlook the thousands of office workers in these plants, performing routine but very necessary tasks.

We could go on and on providing the roster of women's contributions to the war effort. In fact almost all the rest of the 13 million employed women in the country today are not classified as war workers. Some are really doing their part, in exacting roles necessary for maintaining our home defenses and are rendering valuable service.

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WOMEN IN THE PROFESSIONS
(U. S. Census - 1930)

	1910	1920	1930
Teachers	478,027	639,241	860,278
Trained nurses	76,508	143,664	288,737
Artists, sculptors, musicians and teachers of art and music	99,907	87,295	101,255
Librarians	5,829	13,502	27,056
Social and welfare workers	1/	1/	24,592
Actresses and showwomen	13,100	14,354	20,785
College presidents and professors	2,958	10,075	20,131
Authors, editors, and reporters	6,239	8,736	17,371
Designers, draftsmen, and inventors.	3,012	7,664	9,212
Photographers	4,964	7,119	8,366
Physicians, surgeons, and osteopaths	9,015	8,882	8,388
Lawyers, judges, and justices	558	1,738	3,385
Architects	302	137	379
Chemists, assayers, and metallurgists	579	1,714	1,905
Clergymen	685	1,787	3,276
Dentists	1,254	1,829	1,287
Technical engineers	11	41	113
Veterinary surgeons	-	1	11
Other professional pursuits	2,263	5,763	18,898
Semiprofessional and recreational pursuits	2/	2/	55,184
Attendants and helpers, professional service	2/	2/	55,625

1/ Included in semiprofessional pursuits in 1910 and 1920

2/ Comparable figures not available for 1910 and 1920

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Earnings of Women College Graduates in 1934, by Occupation
(From survey of members of American Association of University Women)

Occupations	Number of women	Average (median) year's earnings
Total	7,667 1/	$1,676
Physician or psychiatrist	43	2,708
Personnel administration	121	2,382
Educational executive	1,079	2,190
Home economist	185	1,920
Research worker	170	1,838
Office manager	66	1,792
Trained nurse	47	1,716
Teacher	4,315	1,642
Librarian	427	1,598
Social, health or religious worker	385	1,421
S ecretary	273	1,278
Editorial worker	60	1,267
Independent business	157	1,145
Clerical worker	200	923
Sales, advertising, and publicity	66	891

1/ This total number of women reporting on earnings includes 73 in professions other than those specified, the number in each being too small for the median to be computed.

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PROFESSIONAL TECHNICAL - 1941

OPERATIONS

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MVR

U. S. Department of Labor
WOMEN'S BUREAU
Washington

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December 22, 1941

WAYS BY WHICH THE AMERICAN ASSOCIATION OF UNIVERSITY WOMEN CAN ASSIST IN THE SOLUTION OF PROBLEMS CONCERNING INDUSTRIAL WOMEN GROWING OUT OF THE DEFENSE PROGRAM

I. The Problem

1. Women have not been employed in large numbers in defense industries. In fact marked resistance to the use of women has been common in all quarters. This, in spite of the fact that women are well fitted for many of the defense jobs, and are in need of and eager for employment.

2. Thousands of women once employed in non-defense industries have been thrown out of employment recently, and many more will be as a result of the Government's priority policy.

3. Even though the demand for women workers has not been great, because a shortage of male labor has not existed, the services of women will be required in the future if the present war continues over a long period of time. Women should be trained now for the jobs that they later will be called upon to fill. Opportunitues for such training are not being afforded women.

   Federal funds cannot be used for vocational training for defense jobs until public employment offices have certified that a demand for workers with certain skills exists. Officials of the employment service explain that the demand for women's services by industry is seldom sufficient to justify the establishment of special training courses for them or the inclusion of women in the regular classes.

   As the employment service is set up now, no special facilities are provided for the placing of women. Women's departments do not exist, and women interviewers are not employed for the distinct purpose of interviewing women and securing placements for them. Trained women interviewers; especially interested in the employment problems of women, might do much to educate employers concerning the ability of women to fill many positions for which they are not now used.

4. In certain areas where the defense impact is greatest, the housing problem for women workers is acute. In some of the larger cities there is an actual shortage of suitable rooms, in proper neighborhoods, at prices industrial women can afford to pay. Even where rooms are available, some householders are refusing to rent rooms to women, preferring men tenants on the theory that they use household facilities less.

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Many of the new defense plants have been built in small or rural areas. The workers must either commute long distances or find living quarters near the plants. Few rooms in private homes are available in such communities. The government is building dormitories for single men and single women in some of these areas. Partly because of inadequate facilities, partly because of unsatisfactory supervision these dormitories have proved unpopular with women workers.

5. Recreational facilities are totally inadequate in some of these defense areas. Women are forced either to go without much needed recreation or go long distances to find the ordinary means of recreation.

6. Millions of women are still concentrated in the intrastate service industries, where wages are traditionally low. Cost of living is steadily rising. Wages in these industries have not been raised by the Wage and Hour Law or by trade union activity as has been the case in the interstate industries. Twenty-two States still have no minimum wage laws. In many of the States with minimum wage laws wage orders covering all of the women-employing service industries have not yet been issued, due to appropriations insufficient to enforce properly such orders. One of the most urgent needs of the present emergency is minimum wage protection for women employed in intrastate industries.

7. The observance of proper labor standards is even more urgent today than in ordinary times. Experience and scientific research have proved that the health and productivity of workers depend upon proper conditions of work. Many State hour laws for women permit hours that are much too long properly to protect health. Some laws exempt occupations that should be covered. A few States have no hour laws at all. Federal contracts should contain clauses requiring the observance of labor standards - observance of State laws where they exist, and of specified standards where laws are lacking.

II. A Program.

1. In relation to employed industrial women.

a. Maintenance and improvement of labor standards.

(1) State conferences.

(a) Called jointly by State organizations of women.

(b) Purpose:

1a. To discuss the necessity of maintaining labor standards during this period of extraordinary industrial expansion.

2a. To evaluate adequacy of existing State labor legislation, especially for women.

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3a. To recommend a program which may include:

(1a) Safeguarding labor standards by avoiding the granting of wholesale exceptions to labor laws during the war emergency. (See enclosure entitled, "Recommended Procedure Where State Night Work Laws for Women Permit Administrative Exceptions in Case of Emergency." Similar procedure should be followed by State labor departments that have authority to grant exceptions to hour laws for women and laws requiring one day rest in seven.)

(2a) Payment of the job rate to women who may later take over the work now being done by men.

(3a) The inclusion in defense contracts of a clause requiring the observance of labor standards.

(4a) The passage of State minimum wage laws for the protection of intrastate workers.

(5a) The issuance of additional wage orders under existing State minimum wage laws for women.

(6a) Adequate enforcement of labor laws which may require additional appropriations.

(7a) The active promotion of the adopted program by the American Association of University Women.

(c) Participants in such a conference.

1a. Representatives of the State labor department, especially those responsible for the administration of labor laws for women.

2a. Labor representatives.

(1a) Organized labor.

(2a) Women working in defense industries.

(3a) Women working in service industries.

3a. Labor economists from local colleges and universities..

4a. Leaders among women's organizations concerned with the welfare of women.

b. Proper housing facilities for women workers in defense areas.

(1) In cities and towns.

(a) A survey, with which volunteers can assist, to determine whether housing problem for single employed women exists.

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(b) Campaign to encourage the renting of rooms in private homes to women workers.

(c) The establishment of a room registery service.

(d) Survey of rooms to determine whether those available meet adopted standards.

(e) Recommendation of plans and standards for new housing for women workers. (Division of Defense Housing Coordination and Federal Works Agency.)

(2) In villages and rural areas.

(a) Volunteers' efforts to secure proper standards for government dormitories for women workers.

1a. Physical needs that have been demonstrated:

(1a) Laundry facilities in the dormitories.

(2a) Curtains and other furnishings to make the rooms more homelike.

(3a) Recreation rooms.

(4a) Cooking facilities, or cooperative housekeeping quarters for women..

2a, Personnel needs.

(1a) Person in charge capable of coping with the social problems of group living.

(2a) Nurse.

c. Day care of children of working mothers.

(1) Surveys to determine need for such care in local communities.

(2) Plan for providing for day care of children.

(3) Assistance in securing necessary facilities such as -

(a) Day nurseries.
(b) Nursery schools.
(c) Play schools.
(d) Play grounds.
(e) Care of children in private homes under proper conditions.

(4) Agencies developing plans for child care.

(a) U.S. Office of Education.
(b) U.S. Children's Bureau.

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d. Proper recreational facilities for women workers.

(1) Surveys of community needs.

(2) Plans for coordinated community program.

(3) Needs:

(a) Equipment.
(b) Books.
(c) Space.
(d) Volunteer service.

(4) Agencies working in this field.

(a) United Service Organizations.

1a. Young Women's Christian Association.
2a. National Catholic Community Service.

(b) Office of Civilian Defense and local Defense Councils.

(c) The Recreational Section of the Office of Defense Health and Welfare Services.

(5) Note: The Women's Bureau is preparing a bulletin on Recreation and housing for women defense workers.

2. Program to help secure employment opportunities for women.

a. Study of status of women in defense industries.

(1) Extent to which women are employed in defense industries.

(2) Jobs women are doing.

(3) Work which women are fitted to do in defense industries.

(4) Causes for failure to employ women more extensively.

Note: Women's Bureau can furnish much material in this field.

b. Survey effects of priority regulation upon employment of women in local communities.

c. Promotion of policy of training women now for work they will be called upon later to do in defense industries.

(1) Work through

(a) State and local public employment offices.

(b) State and local vocational school authorities.

(c) Training within Industry, Labor Division, OPM.

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d. Cooperation with representatives of Women's Bureau on Regional Labor Supply Committees.

(1) Regions in which Women's Bureau has representatives. (Dollar-a-year women.)

Region I. Women's Bureau representative:
Miss Frances W. Valentine,
Green Meadow Farm,
Ashland, Mass.

Region III. Women's Bureau representative:
Miss Rebecca Smaltz,
315 North 12th St.,
Philadelphia, Pa.

Region V. Women's Bureau representative:
Miss Elizabeth Magee,
341 Engineers' Building,
Cleveland, Ohio.

Alternates:

Mrs. Warick Hobart,
47 Wiggins Block,
Cincinnati, Ohio.

Mrs. Kathleen Lowrie,
4317 Glendale St.,
Detroit, Michigan.

Region VI. Women's Bureau representative:
Mrs. Agnes J. O'Connor,
2511 North Campbell Ave.,
Chicago, Illinois.

* Region VIII. Women's Bureau representative:

Mrs. Elsa Z. Duncan,
128 West Elmwood Place,
Minneapolis, Minnesota.

(2) Partial function of the Regional Labor Supply Committee:

(a) To formulate plans for recruiting labor for defense industries.

(b) To make recommendations with respect to training needs and facilities that have not been resolved at the State level.

* For a complete list of regions and States included in each, please see the enclosure entitled, Regions of the Labor Supply Committee.

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U. S. Department of Labor
WOMEN'S BUREAU
Washington

December 1941

RECOMMENDED PROCEDURE WHERE STATE NIGHT WORK LAWS FOR WOMEN PERMIT ADMINISTRATIVE EXCEPTIONS IN CASES OF EMERGENCY (Similar procedure recommended in the case of hour laws or laws requiring one day of rest in seven.)

I. Age: Employment of girls under 21 years of age at night should not be permitted.

II. Application for exceptions.

Written application showing need for exceptions to night work law should be made to the proper State authority by individual plants.

III. Investigation by labor commissioner

Each request for exceptions to the law should be thoroughly investigated by the commissioner of labor. The investigation should determine:

1. The nature of the government contracts.

   a. The number of contracts held by the firm.
   b. Direct or subcontracts.
   c. Whether time within which contract must be completed is specified.
   d. Whether penalty clause for failure to complete contract on time is attached.

2. Where the bottleneck in production lies.

   a. Department of plant.
   b. Number of women involved.
   c. Operations performed by these women.

3. Whether by complete utilizarion of available space and equipment more women could be employed during the daytime.

   a. Whether application has been made to public employment offices for additional workers.

   b. Whether the employment office has made a job analysis to determine the availability of additional workers.

   c. Whether the firm has attempted to train additional workers.

   d. Whether workers who would be available for the job are being trained in vocational schools in the community.

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IV. Permits to employ women at night.

1. Permits should be granted only when thorough investigation has revealed that an actual emergency exists.

2. Permits should be granted not to an entire industry, but only to individual firms for which the need has been demonstrated.

3. Permits should be in writing.

4. They should be granted for a limited period, such as the duration of a specific defense contract.

5. They should stipulate that the following working conditions should be maintained by the plant for workers on the night shift:

   a. Hours of work not to exceed 8 a night.
   b. One night of rest in seven.
   c. A half-hour meal period with opportunity for a hot nourishing meal.
   d. Best possible lighting and ventilation arrangements in accordance with latest scientific developments.
   e. Special effort to prevent, wherever feasible, either constant standing or constant sitting, by providing seats adjusted to the worker and the work.
   f. Increased safety precautions, as night work is more conducive than day work to accidents.
   g. Adequate first-aid facilities and medical department.
   h. Supervision of work at least as adequate as on the day shift.
   i. Adequate and conveniently located washing, drinking, and toilet facilities.
   j. Adequately equipped and staffed lunch room, dressing room and rest room.
   k. Even more careful supervision than on the day shift of women workers, from the viewpoint of personnel policies, by a competent employment executive, preferably a well-qualified woman.

6. Plants granted permission to employ women at night should be made responsible for adequate transportation facilities for women employed on the night shift.

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U. S. Department of Labor
WOMEN'S BUREAU
Washington

REGIONS OF THE LABOR SUPPLY COMMITTEE

Region I.	Headquarters:	Boston	
	States included:	Maine New Hampshire Vermont	Connecticut Rhode Island Massachusetts
Region II.	Headquarters:	New York	
	States included:	New York	
Region III.	Headquarters:	Philadelphia	
	States included:	Delaware New Jersey Pennsylvania	
Region IV.	Headquarters:	Washington	
	States included:	Maryland Virginia	West Virginia North Carolina
Region V.	Headquarters:	Cleveland	
	States included:	Michigan Ohio Kentucky	
Region VI.	Headquarters:	Chicago	
	States included:	Indiana Illinois Wisconsin	
Region VII.	Headquarters:	Birmingham	
	States included:	Alabama Florida Georgia	Mississippi South Carolina Tennessee
Region VIII.	Headquarters:	Minneapolis	
	States included:	Iowa Minnesota Nebraska	North Dakota South Dakota

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Region IX.	Headquarters:	Kansas City	
	States included:	Arkansas Kansas	Missouri Oklahoma
Region X.	Headquarters:	San Antonio	
	States included:	Louisiana New Mexico Texas	
Region XI.	Headquarters:	Denver	
	States included:	Arizona Colorado Idaho	Montana Utah Wyoming
Region XII.	Headquarters:	San Francisco	
	States included:	California Nevada	Oregon Washington

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N. Y. Times, May 9, 1941

Robinson file

53 WOMEN NAMED AS LEADERS OF SEX

Federation of Women's Clubs Says they Represent Great Strides of past 50 Years.

MRS. ROOSEVELT ON LIST

Mrs. Charles A. Lindbergh is Another - Federation invites Group to Golden Jubilee

Washington, May 8. The General Federation of Women's Clubs today announced its selection of fifty-three women in thirty occupations as representing "the great strides made by women in the past 50 years."

The women, who include Mrs. Franklin D. Roosevelt and Mrs. Charles A. Lindbergh, as "notably successful pioneers" have been invited to the general federation's golden jubilee triennial convention in Atlantic City, N.J., May 19-24.

The list includes:

Aviation - Mrs. Miguel Otero of Santa Fe, N. M.; Ruth Nichols of Rye, N.Y.; Mrs. Charles A. Lindbergh.
Broadcasting - Judith Waller of Chicago.
Business - Mrs. Eleanor Patterson, Washington newspaper publisher; Josephine Roche of Denver, coal mine owner and former assistant secretary of the Treasury.
Child Welfare - Katherine F. Lenroot, Chief of the United States Children's Bureau.
Diplomatic Service - Mrs. Ruth Bryan Rohde, former Minister to Denmark; Mrs. J. Borden Harriman, former Minister to Norway.
Education - Dr. Mary E. Woolley, former president of Mount Holyoke College; Mrs. Cora Wilson Stewart, Kentucky rural educator; Miss Martha McChesney Berry, Georgia educaton

Dorothy Dix in Journalism

Engineering - Mrs. Frank Bunker Gilbreth of Montclair, N.J., consulting engineer; Mrs. Nora Stenton Barney.
Exploration - Mrs. Clark Getts, the former Mrs. Martin Johnson.
Government Service - Secretary of Labor Frances Perkins.
Health - Dr. Florence R. Sabin, anatomist, Denver; Dr. Alice C. Evans, bacteriologist, Washington, D.C.; Dr. Josephine S. Baker.
Humanitarian Service - Mrs. Franklin D. Roosevelt.
Journalism - Dorothy M. Dix of New Orleans, Miss Maude MacDougall of Washington.
Judicial Field - Judge Florence Allen of Cleveland, Judge Genevieve Cline of New York.
Legal Field - Mary L. Lathrop of Denver.
Literary - Dorothy Canfield Fisher and Margaret Wade Deland, Novelists.
Motion Pictures - Mary Pickford.
Motion Picture Industry - Mrs. Thomas G. Winter, a past president of the General Fed. Hollywood, California.
Music - Mrs. Carrie Jacobs Bond and Mrs. H. H. A. Beach, composers.
Frontier Nursing - Mrs. Mary Breckenridge of Wendover, Ky.

Geraldine Farrar in Opera

Opera - Geraldine Farrar, formerly of Metropolitan Opera Co.
Orchestra Conducting - Ethel Leginska of London, Antonia Brico of New York.
Peace and Women's Rights - Mrs. Carrie Chapman Catt.
Penology - Mary B. Harris, Alderson, W. Va.
Politics - Jeanette Rankin of Montana, first Congresswoman; Mrs. Nellie Tayloe Ross, first woman Governor(Wyoming); Senator Hattie Caraway of Arkansas, first woman to be re-elected U. S. Senator; Mrs. Miriam A. Ferguson, Governor of Texas.
Radio - Margaret Cuthbert, director of women's division of RCA; Kate Smith, singer.

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Religion - Dr. George Elmo Markness of Evanston, Ill., Professor of Religion; Mrs. Hilda Libby Ewes, church official, Portland, Me.
Social Service - Helen Keller, born deaf and blind; Evangeline Booth of the Salvation Army.
Sports - Eleanora Sears, Mrs. Hazel H. Wightman.
Stage - Ethel Barrymore, May Robson, Maude Adams.
Work for Women in Industry - Mary Anderson, head of the U. S. Women's Bureau.

OCCUPATIONS

PROFESSIONAL + TECHNICAL - 1942

REPRODUCED FROM THE HOLDINGS OF THE NATIONAL ARCHIVES

Occupational Reprints
AND ABSTRACTS
No. 108
SCIENCE RESEARCH ASSOCIATES • 1700 PRAIRIE AVE. • CHICAGO

CAREERS FOR WOMEN IN WAR WORK

Labor Information Bulletin – July 1942

Women are being employed in technical, management, scientific, engineering, and accounting jobs in places hitherto reserved exclusively for men, according to a survey of a large number of colleges in all parts of the country. Many colleges are offering special courses along these lines to women with some background of science or mathematics. Women engineers, chemists, architects, women in almost any scientific or professional field outside of teaching, nursing, or dietetics, have been rarities. Now there is great demand for women with such training or experience, or with the interest to undertake such training.

Women specialists already are forwarding the war effort. Outstanding in the chemical field is a woman who works on finishes that will resist salt water, sleet, changes in temperature, fluids like de-icers, and so on. There can be no corrosion on a bomber. The first woman to graduate from a special university course in the composition of high explosives is now working in an ordnance plant. Another investigates the chemistry of lubrication oils. There is a woman specialist in aluminum alloys, one doing research in radio communication, another teaching Navy courses in the same field. The first woman to get a mechanical engineer's degree is working on air conditioning.

Women with artistic talents may turn to camouflage. A New York concern in this field expects all increases and replacements in personnel to be women. The Public Building Administration has appointed a woman as consultant on defense housing projects. She concentrates on plans for interiors, stressing economy in building costs and short cuts for the homemaker through careful arrangement of closets and hallways. Both the Weather Bureau and the Civil Aeronautics Administration need women in the field of meteorology, and special courses are now open to them.

New places, too, are being found for women in services long the province of their sex. Mrs. Meryl P. Stone is a food consultant in the Subsistence Branch of the Quartermaster Corps, working with Miss Mary Barber, food consultant to the Secretary of War. Thousands of women must work to maintain the country's health, not only as trained nurses but as dietitians, technicians, medical-social workers, medical-record librarians, and dental hygienists. Jobs are available for thousands of women in occupational therapy, and a shortened and intensified course of training in this field is being offered at one of the universities. Of more than 800 registered therapists in the country, all but 25 are women. More doctors are needed for the armed forces. While women are eligible to join the Medical Reserve Corps of the Army, they are not given officer rating. They may not join the Medical Reserve Corps of the Navy. Nurses, on the contrary, are eligible for both services and receive military rating, though not a corresponding rate of pay. During the First World War contract surgeons, 34 of whom were women, were employed at Army base hospitals but received less pay than members of the reserve corps. British armed services welcome women doctors, giving them equal rank, salaries, and other privileges with men.

There is a demand for women engineers, architects, and mathematicians. A large electrical company has admitted such women to its staff, where they are doing well in men's jobs. Women who have majored in sciences and who hold amateur radio licenses are needed either in radio location work in research laboratories or in development and installation of radio communication facilities. Laboratory work is employing many women and will need more. For example, 56 women are doing tests on steel in an Ohio plant. Women are being trained to replace men in the testing of bituminous materials in a State highway department. Women with a background of science or mathematics are wanted to inspect gages to be used in testing ordnance materials.

Colleges and universities in various parts of the country are offering special courses along scientific lines. Some engineering departments are admitting women for the first time. Special training is being offered women for supervisory or personnel work, and for office positions formerly held by men.

Great Britain is recognizing the contribution to be made by women with special experience or education. The Women's Technical Service Register

One of Uncle Sam's laboratory technicians

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has been set up by the Appointment Department of the Ministry of Labor and National Service. The following are occupations that may be filled from the register:

Instructors in works training schools.
Junior draftswomen.

Assistants in planning, production, and progress departments.
Assistants in estimating and rate-fixing offices.
Motion or time-study workers.
Electrical technicians and testers.
Laboratory assistants for radio and other branches of research.
Assistants in mechanical testing and metallurgical departments.
Inspectors, examiners, or assistant examiners for higher-grade work.

It is not anticipated that many women will be found available who already have experience or training in the occupations listed, but women with a good education and mathematical or mechanical bias can be trained quickly to do valuable work in such posts. Some firms are willing to do their own training from start to finish. For those who require some elementary knowledge of engineering as a basis, the Ministry is prepared to give background courses.

Women are already filling responsible positions along these lines. In a plant repairing aircraft, women extract from a complicated set of blueprints all the parts and material required to complete the repair job; they record in what department details are to be made, the exact amount of material required, and select other sources of replacements. A woman in a shell factory has charge of all production figures. As assistant to a department manager, another woman reads the most complicated drawings, sets up machines, and adjusts tools. She must see at a glance whether these are cutting correctly.

It has been found that women are very good at instructing other women. One large electrical firm employs a woman as chief instructor in its training school. In an aero-engine works, though the instructors are men, a woman makes an ideal head of the training school. Her technical knowledge enables her to put each girl into the type of training for which she is best fitted and to see that she is suitably placed when trained.

The Order of Employing Women in War Plants

The Women's Bureau of the U. S. Department of Labor has developed a definite policy as to priorities that should be observed in the employment of women workers if this country's labor force is to be most effectively used. This should be applied at the present time, and may be further developed as the situation changes. The Women's Bureau recommends:

1. First women to be employed should be those with factory experience who have lost their employment because of priorities in materials and plant adjustments to war production.
2. Then, other unemployed women who are registered with the Employment Service seeking work.
3. Next, if necessary, the more than 800,000 girls coming from high schools and colleges.
4. Women caring for their homes, particularly those with small children, should not be asked to go into factories and workshops until it is absolutely necessary. They can be much more helpful to the Nation by staying in the home and taking care of the children. It is recognized that in some cases these women find it necessary to work, and for them some provision must be made.

Employment of women in war plants doubled from the time of the Pearl Harbor attack to the spring of this year, and will be more than doubled again by the fall. But offsetting these are the women losing jobs because of shortage of materials or the transfer of plants to war production. For this reason the numbers on Employment Service rolls did not decline though numbers employed increased so rapidly. For example, it was estimated recently that 150,000 workers on women's clothing were jobless. Three-fourths of the workers in this industry were women. At the same time another 30,000 workers on men's clothing—where nearly three-fourths were women—were out of jobs in the New York area alone. Shortage of steel needles, as well as of materials, had earlier affected the sewing trades.

Efforts are being made to convert available consumer-goods plants to the manufacture of gas masks, tents, leggings, work jackets, first-aid kits, and other light war materials. However, it was estimated by the New York Department of Commerce that if consumer industries in that city were cut 10 percent, war industries existing there would have to be expanded 56 percent to maintain normal employment.

Though the need for women workers has increased markedly, the major call for them still is in the future. Less than a third of the expected hires in war plants in the first half of 1942 were to be in establishments that would take women in the types of jobs open, according to reports to the United States Employment Service from over 12,000 such plants. Largest numbers of anticipated openings were in making ammunition, aircraft, and electrical machinery. In such an important industrial State as New York, 1,400 employers reporting in April expected women to constitute only about one-fifth of the workers they would take on by the autumn of 1942. The male labor supply still was so large this spring that over 1,100 of these employers did not plan to include any women in their new labor forces before the fall.

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U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

January 21-22, 1942.

COMMITTEE C.—REPORT OF COMMITTEE ON PROFESSIONAL WOMEN IN THE WAR PROGRAM

INTRODUCTION

Need for Professional Women.

Though little statistical information is available, present indications all point to the conclusion that this country's transfer to a wartime basis will result in a tremendous increase in the need for women's services in the various professional fields. In the war industries and in the Government, the war production program is already creating new openings for professional workers—openings that did not exist before the war. In other fields, the demand for workers with professional training also is growing, especially in auxiliary services for the armed forces and in maintaining civilian morale.

But though there is a greater need for professional workers in many fields than there was before the war, the enlistment of men in the armed forces is gradually decreasing the available number of such workers. To supply the need and compensate for the withdrawal of many men from professional work, it is becoming evident that the country will have to look to women workers to a greater extent than ever before. Women's organizations and leaders of women's groups consequently have a great responsibility in the development of a constructive program for utilizing professionally trained women in the war effort.

Some Problems To Be Considered.

Two of the principal problems that require attention are those of placement and training of professional women workers. In certain professions it is likely that enough trained workers already exist, but how can the Government or the individual employer locate them and help to place them in positions of suitable responsibility? In other professions it is apparent already that the supply of trained women workers will be insufficient. The question here is, How can we train enough auxiliary workers to fill some of the subsidiary jobs and thus enable qualified women to step up to more responsible types of work? Can we do this without breaking down established professional standards, and how can such standards best be protected?

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U. S. DEPARTMENT OF LABOR
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Location and Placement.

In developing a plan for utilization of workers already trained, an initial difficulty is the fact that professional women have received little consideration as a special group in the labor market. So far as we can ascertain, no central authoritative source exists for information as to the total number of women trained to do professional work in the various professions. Furthermore, no adequate machinery exists through which individual professional women can be quickly and efficiently placed in particular jobs. Employers with new jobs to fill in the personnel and management departments of war industries do not know how to find the right professional women for the new openings. The question of an adequate clearing-house, or central source of information about professional women workers, is one that requires immediate thought, and if possible directed action. An efficient placement program is essential in order to utilize the services of trained professional women in the war program.

Training of Additional Workers.

Another problem to be considered in connection with professional women is that of training. The shortage in some fields will make it imperative to have additional workers. However, in nearly every profession the established course of study is both long and expensive. It is doubtful whether a sufficient number of additional workers can be trained along the traditional lines to meet the demand created by the war emergency. The result is likely to be an increasing pressure to break down professional standards. To prevent the possibility of such a break-down, consideration must be given immediately to methods of training auxiliary workers who will assist fully qualified trained workers and who will perform subsidiary jobs.

Some Fields in Which Additional Workers Will Be Needed.

One of the professions in which there is known to be a shortage of trained workers is that of nursing. The Subcommittee on Nursing of the Office of Defense Health and Welfare has estimated that 30,000 additional nurses will be needed in the present year, including roughly about 10,000 for the Army and Navy together, 10,000 for the Public Health Service, and 10,000 for institutions. The Committee is attempting to meet this need in various ways, among which are an intensive campaign to enroll additional girls in nurses' training schools, and a campaign to persuade retired nurses to come back to active duty. The Committee has also outlined a course of study for nurses' auxiliaries—paid workers who will do minor types of work, thus releasing graduate nurses for more important and difficult assignments. Nurses' auxiliary courses were given last summer by WPA and NYA, and large numbers of women attended them with the definite purpose of obtaining paying jobs in connection with defense work.

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Another field in which additional trained workers already are needed is that of dietetics. The Army hospitals are now employing 300 trained women dietitians and they expect to employ a total of 400 before the end of the war. These dietitians usually are taken from civil-service lists and must meet the standards set up by the American Dietetics Association, which requires a college degree plus one year of internship in a hospital or other large institution. However, probational emergency appointments have been made lately of women without the necessary qualifications, due to the difficulty experienced by the Civil Service Commission in finding women with the required training. The war program is increasing the number of potential jobs in the dietetics field, and it is expected that both war industries plants and government dormitories will have considerable need for trained dietitians. This suggests the possibility of setting up auxiliary training courses in this field, and establishing minimum standards for auxiliary workers which will permit experience to be substituted for some part of the customary professional training.

In personnel work there is an increased demand for trained workers as employee counselors in government agencies, and it is expected that private employers will call for such workers to fill positions in expanding war industries plants. In the expanded Federal Employment Service, also, trained interviewers and various other types of personnel workers undoubtedly will be more in demand. Though personnel work is a highly specialized field, some effort must be made to provide workers for this type of service, which is of special importance in wartime. The feasibility of developing special training courses should be explored, to enable women to shift quickly from other professional fields to personnel work in case of a greatly increased demand for personnel workers.

In the physical sciences the war has already opened new jobs to women workers in government arsenals and other plants operated by the Army and Navy. The Army has requested the Civil Service Commission to supply 1,000 women with college training in physics or chemistry, plus mathematics, for positions in government plants. New demands for women scientific workers in private industries working on war contracts also are expected to occur in the near future. The possibility of giving specialized scientific courses to women who have already had some general college training is suggested by the opening of new positions in this field.

The rapid expansion of airplane plants may give women new opportunities in engineering, metallurgy, meteorology, and radiology. Positions of this kind require special training, some of which is already being given to men by certain technical engineering schools. In construction work it may be necessary to employ more women as draftsmen and architects. Consideration should be given to these and the many other professional fields in which all present signs indicate that the demand for women workers will be greater than ever before.

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RECOMMENDATIONS

1. The Committee recommends that it confer with Mr. James C. O'Brien, Promotion Officer of the National Roster of Specialized and Scientific Personnel, to ascertain the extent to which the roster may be used as a clearing-house for information about trained professional and scientific women workers, and as a means for placing them in positions both in the Government and outside.

2. The Committee recommends that it confer with Mr. John J. Corson, Director of the Bureau of Employment Security, to discuss the best means of increasing the value of the United States Employment Service to women workers in professional, subprofessional, office, and industrial groups; that it advise him of the need for trained women interviewers in each local office who will give special attention to the placement and guidance of women workers; and that it recommend to him the appointment of women officials in the Employment Service who will be responsible for formulating policies for placement of women workers, with particular emphasis on expanding and safeguarding their opportunities in war industries and facilitating their transfer from consumer-goods industries to war industries.

3. The Committee recommends that it work with professional associations to help maintain their present standards for professional workers or to modify them as the public interest may require; and that it confer with such associations concerning method and standards of training for work of a semiprofessional or supervisory character in war industries as an emergency measure to relieve the shortage of trained professional workers in some fields.

4. The Committee recommends, as a means of improving the working conditions of women in war factories, that the attention of employers be called to the need of engaging as part of the regular force trained women as personnel workers, including employee counselors, dietitians, and other trained professional women.

5. The Committee recommends, in view of the present lack of information in certain professional fields, that it work as a continuing committee on the possible means of obtaining more definite information as to the supply and demand for trained women workers in highly specialized fields such as medical, dental, engineering, and many others.

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U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

January 21-22, 1942.

COMMITTEE D.—REPORT OF COMMITTEE ON LABOR STANDARDS

FOR WOMEN WORKERS IN THE WAR PROGRAM

INTRODUCTION

Victory in the war in which the United States is now engaged depends as truly on the workers in our factories and arsenals as on the men in our fighting forces. The President has warned that on production rests the fate of the United Nations. In this unprecedented effort to produce, women will be employed in numbers never before equaled in American history. We are told that this is to be a long war, and that production must continue and increase until peace has been restored.

Greater and ever greater output can be attained only if the physical fitness of our workers is preserved. This is not a theory but a proved fact. Scientific evidence accumulated over the years has demonstrated beyond question that the amount of production, the quality of the product, and the continuous flow of goods depend on the conditions under which workers are employed. We in America must not make the mistake of retarding ultimate production by discarding at the outset of this conflict those employment standards that have helped to make our workers the most productive in the world. So long as the labor reserves in this country include hundreds of thousands of willing workers whose only unfitness for defense jobs consists in lack of training, the relaxation of labor standards should not be the answer to the Nation's appeal for all-out production.

Long hours on 7 days of continuous labor, to which the British were forced to resort, have resulted in higher rates of absenteeism, in increased cases of illness, and more frequent accidents, especially among women, during the present war as during that of 1914-18. Physical disability on the part of the worker means interrupted employment and therefore reduced production.

In our own country we are discovering already that long hours are interfering with employment in war industries. Many women who have been attracted to defense plants by the relatively high wages paid are gradually drifting back to the nondefense industries from which they came, because the strain of the long hours and the 6-day, sometimes 7-day, workweek has proved too great for their endurance.

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RECOMMENDATIONS

In order that the Nation's goal of total war production may be attained, the Committee on Labor Standards for Women Workers in the War strongly recommends that labor standards that have been proved essential to high production be preserved.

1. Hours of Work.

The Committee recommends that the following basic principles in respect to hours of work be observed by all plants whether privately or publicly operated:

a. A maximum 48-hour workweek.
b. An 8-hour day.
c. One day's rest in seven.
d. Adequate meal and rest periods.

2. Night Work.

The Committee recommends that the employment of women at night be limited to plants maintaining proper working conditions and engaged in war work to which such employment is essential. It further recommends the prohibition of night work for girls under 21 years of age.

3. Temporary Modifications of Standards Because of War Emergencies.

The Committee realizes that, due to the suddenness with which the Nation was thrust into war, temporary emergencies may arise in certain establishments holding war contracts that necessitate the employment of women for short periods at standards somewhat lower than those recommended above and established by law in many States. In such cases the Committee recommends that—

a. Authority to grant temporary modifications of State labor laws be lodged in State departments of labor.

b. Each employer seeking temporary exemption from State labor laws be required to file an application with the labor commissioner.

c. Each application be thoroughly investigated by the labor commissioner to determine whether the need for such an exemption actually exists.

d. No permit granting an exemption be issued to an employer who can maintain labor standards by using available labor supply, or by making adjustments in the organization of his plant.

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e. No permit be issued, even though trained workers are lacking, unless the employer make satisfactory arrangements to train or to secure trained workers within a reasonable time.

f. No exemptions be granted to employers not engaged in war work.

g. No permit be issued if the health and welfare of the workers would be endangered thereby.

h. Permits be limited to individual plants and for specified periods of time.

i. Permits be revoked when exemptions are found to be unnecessary to maintain maximum war production.

4. Additional State Labor Inspectors.

To assure the successful operation of the procedure recommended above, and that labor standards are not relaxed in violation of State laws and regulations, frequent and rigorous plant inspection will be required. The Committee strongly recommends, therefore, that more inspectors be added immediately to the staffs of those State labor departments that at present lack sufficient personnel to carry on properly the additional work occasioned by the war.

5. Amendments to Labor Laws.

The Committee warns that, under the false guise of patriotism, many bills intended to lower present legal labor standards may be introduced into the State legislatures during the present year. It urges that all organizations represented at this conference be vigilantly alert to the dangers of such bills, and vigorously oppose their passage.

6. Equal Pay for Men and Women.

The principle of setting wage rates for jobs without reference or respect to the sex of the workers has been well established in union contracts in this country. The Committee believes that this policy should be followed by all industry, and therefore recommends that wage rates, including the entrance rates, should be the same for women as for men, and in no case should the employment of women be used to break down established rates.

7. Minimum-Wage Orders for Intrastate Industries.

Women employed in the service industries are not protected by the Federal Fair Labor Standards Act. They are affected as are all workers by the 12 percent increase in the cost of living which has occurred since the outbreak of war in Europe. Though these women are not directly engaged in defense production, their services are

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essential to the well-being of all citizens, including those serving their country in factories and in military camps. The percentage of workers belonging to trade-unions is not so great in the service industries as in manufacturing, consequently the opportunity for securing wage adjustments through collective bargaining is much less. The Committee believes it vitally important that all States with minimum-wage laws that have not already issued wage orders for all service industries do so as rapidly as possible. It therefore recommends that the organizations represented at this conference take the initiative in promoting the issuance of such orders, and where insufficient appropriations is the deterrent to the issuance of new orders, steps be taken to secure additional funds for the State minimum-wage divisions.

8. Protection Against Industrial Accidents and Poisons.

Protection against accidents is essential if continuous and maximum production is to be maintained. The Committee recommends that during this present emergency more than usual care be taken to provide safe and healthful workplaces for workers; that State safety laws be rigorously enforced, and be extended when inadequate for the full protection of the workers' safety; and that special precautions be taken against those industrial poisons to which women are peculiarly susceptible, to protect the many thousands of women workers entering defense industries.

9. Extension of Social Insurance Coverage.

Because the probability of accidents is greatly increased by the rapid influx of inexperienced workers into industry, and by the accelerated tempo at which industry is operating at this time, the Committee recommends that State workmen's compensation laws be amended to cover the employers of all workers.

The Committee also recommends that the coverage of the Federal Old-Age and Survivors Insurance Law and State unemployment compensation laws be extended to all employees, and that the principle of proposed legislation to provide benefit payments in addition to regular unemployment benefits to workers unemployed because of war priorities be supported.

10. State Committees.

That every effort may be made to increase war production through the maintenance of proper labor standards, this Committee recommends that in each State the local branches of the national organizations represented at this conference form the nucleus of State-wide committees for the promotion of labor standards for war production.

11. Committee on the Employment of Women in Agriculture.

Finally the Committee recommends that the Women's Bureau appoint a committee to study the problems of the employment of large numbers of women in agriculture, and to recommend a program that would provide properly for the welfare of such workers.

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U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

January 21-22, 1942.

COMMITTEE E.—REPORT OF COMMITTEE ON COMMUNITY FACILITIES FOR WOMEN WAR WORKERS

INTRODUCTION

The Committee on Community Facilities for Women War Workers based its discussion and recommendations on observations of workers in the United Service Organizations agencies present and on surveys of rural defense areas made by field agents of the Women's Bureau. Housing and facilities for eating, transportation, and recreation were given special consideration.

Housing problems are due to an insufficient number of rooms, and overcrowding in the rooms available, in smaller towns in rural defense areas; to discrimination against women and especially against industrial workers; to inadequate room-registration service and lack of inspection of rooms listed; and to the lack of low-cost living quarters for girls in the service trades.

The so-called "duration dormitories" being built by a government agency were discussed from the point of view of making them more attractive and more livable for girls. Qualifications for the directors of women's dormitories were discussed. It was agreed that much of the success of the dormitories will depend on getting the right type of persons in these positions. However, some members of the group felt that a woman with wide experience and good judgment might be as successful as a professional person trained in group work. Also, representatives of working women felt that there should be a great deal of self-government and a minimum of regulations.

Eating facilities in the new areas are a very difficult problem, especially for girls living in the dormitories, since eating facilities have not been included in those buildings and distances to existing facilities are considerable.

The transportation problem in some communities is very serious. In many cases the plants are in the country, several miles from the nearest town and some distance from the dormitories. Unlighted lonely stretches of road often lie between the plants and the homes of the workers. For girls working on night shifts this constitutes a real problem. Tire rationing probably will aggravate the transportation difficulties, since many of the workers are commuting in private automobiles at present.

Adequate recreational facilities, commercial and private, naturally are deficient in smaller towns. There has been considerable misunderstanding of the functions of the United Service Organizations in these areas, and resistance to providing recreational facilities for defense workers. It was brought out in the discussion that the recreational problem is more serious for women than for men because facilities such as basketball, bowling, and so forth, often are planned for men and completely utilized by them. Plans for the recreation of women, taking into account their jobs and special

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interests and needs, should be included in the general recreational scheme. It was emphasized that workers should be included in recreational planning committees.

The Committee members emphasized throughout the discussion the need for the appointment of women on the local defense councils and other planning committees to present the point of view of women and safeguard their interests. It was believed too that local women's organizations often are unaware of the problems relating to women in defense areas. It was agreed that women's organizations could help by seeing that women are appointed to the various committees, by cooperating in the establishment of rooms registration, and by interpreting to their communities the recreational needs of defense workers and the functions of the United Service Organizations.

RECOMMENDATIONS

1. With Respect to Method of Procedure.

That the national offices of women's organizations and the Women's Bureau cooperate in a joint program of obtaining and disseminating information about problems of women workers in defense areas:

a. That the Women's Bureau provide the national offices with information that it obtains from field surveys and other sources, which the national offices will transmit to local groups.

b. That the local groups in turn send information back through the national offices to the Women's Bureau.

c. That the Women's Bureau take up with the proper government authorities community and other problems relating to the welfare of women workers.

2. With Respect to Public Relations.

That the women's organizations undertake the following program through their local groups:

a. To obtain adequate representation of women on defense councils for the purpose of insuring that women's needs are safeguarded, especially in relation to housing and recreation.

b. To carry on an educational campaign in local communities to make the public conscious of the needs of industrial and service women with particular emphasis on housing; and to explain the work that the United Service Organizations and government agencies are doing to provide recreation for such workers.

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3. With Respect to Specific Problems.

a. Housing.

(1) That where government dormitories are provided, adequate provision should be made for privacy, for laundry, individual cooking facilities, and other normal conveniences of civilized life; that in each government dormitory for women, the director in charge should be a trained woman who has had experience in working with individuals and groups; is able to act as a public relations person with the community; that there should be self-government and a minimum of supervision; that where groups are working on different shifts, the dormitory should be in a separate building from facilities provided for recreation and eating.

(2) That for the benefit of women workers who do not live in government dormitories, the national organizations should urge their local groups to investigate the advisability of setting up a local fair-rent board in each defense community; and to determine the necessity of establishing a room registry for women workers.

b. Food.

That steps be taken to insure that the proper government agency will assume responsibility for providing adequate eating facilities.

c. Recreation.

That recreational programs should include the community as a whole and not segregate war workers; that women's needs should be considered; and that women workers should be represented on local recreation committees.

d. Transportation.

That steps be taken to insure that the proper government and local agencies be made responsible for the transportation needs of women workers in defense areas.

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Conference on

War Demands for Trained Personnel

under the auspices of

The Institute of Women's Professional Relations

The Mayflower Hotel, Washington, D. C.

Friday and Saturday
March twentieth and twenty-first
nineteen hundred and forty-two

REPRODUCED FROM THE HOLDINGS OF THE NATIONAL ARCHIVES

Conference on

War Demands for Trained Personnel

Friday, March 20, 1942

8:00-9:30 REGISTRATION

9:45 GENERAL SESSION

Subject:

THE SUPPLY OF TRAINED WORKERS IN RELATION TO THE DEMAND OF THE TOTAL WAR PROGRAM

Presiding: HON. EDITH NOURSE ROGERS, Congresswoman, Massachusetts

Welcome: MR. WILLIAM L. BATT, Director, Materials Division, and Chairman, Requirements Committee, War Production Board

Speakers:

The Selective Service—BRIGADIER GENERAL LEWIS B. HERSHEY, Director, Selective Service System

The Executive Departments—HON. ARTHUR S. FLEMMING, U. S. Civil Service Commissioner

The Defense Industries—MR. DONALD H. DAVENPORT, Chief, Employment and Occupational Outlook Branch, Bureau of Labor Statistics, U. S. Department of Labor

Employment Machinery for Recruitment and Training—BRIGADIER GENERAL FRANK J. MCSHERRY, Deputy Director for Labor Supply and Training, Labor Division, War Production Board

12:15 LUNCHEON—East Room

Presiding: HON. CHASE GOING WOODHOUSE, Secretary of the State, Connecticut; Director, Institute of Women's Professional Relations

HOW CAN STANDARDS BE ADJUSTED IN THE WAR PROGRAM

HON. FRANCES PERKINS, Secretary, U. S. Department of Labor

Hostesses:

MRS. HENRY A. WALLACE
MRS. ROBERT P. PATTERSON
MRS. ROBERT JACKSON
MRS. STANLEY F. REED
HON. LUCILLE F. MCMILLIN, U. S. Civil Service Commissioner
MISS LOUISE GRIFFITH, Professional Relations Adviser, Informational Service, Federal Security Agency

1:45-5:00 ROUND TABLES

Section I—BUSINESS AND LAW

Presiding: DEAN EMERY OLSON, Chairman, Committee on Administrative Personnel, U. S. Civil Service Commission

Economics and Statistics—DR. JAMES S. HATHCOCK, Examining Division, U. S. Civil Service Commission

Finance—MR. WILLIAM POWERS, Director, Personnel Division, American Bankers Association

Industrial Relations—MR. CHANNING R. DOOLEY, Director, Industrial Relations, Socony Vacuum Oil Co.; Director of Training Within Industry, War Production Board

REPRODUCED FROM THE HOLDINGS OF THE NATIONAL ARCHIVES

7:30 DINNER—Hotel Mayflower (Informal Dress)

Chairman: MRS. JOUETT SHOUSE, Chairman of the Board, Institute of Women's Professional Relations

Presiding: MRS. CHASE GOING WOODHOUSE, Director, Institue of Women's Professional Relations, and Professor of Economics, Connecticut College

A NATION AT WAR

JUDGE ROBERT P. PATTERSON, Under Secretary of War

Saturday, March 21st

9:15-12:00 ROUND TABLES

Section IV—DISSEMINATION OF INFORMATION

Presiding: MR. ROBERT HUSE, Executive Officer, Office of Facts and Figures

Government Information—MR. ROBERT W. HORTON, Director, Division of Information, Office of Emergency Management

Radio and Television—MR. WILLIAM B. LEWIS, Assistant Director, Office of Facts and Figures, in Charge of Operations; Vice-President, Columbia Broadcasting Company

Translating, Decoding and News Analysis—MR. LLOYD FREE, Foreign Broadcast Monitor Service, Federal Communications Service

Newspaper—MISS KATHLEEN MCLAUGHLIN, *New York Times*

Graphics—MR. WILLIAM PHILLIPS, Chief, Publications Section, Division of Information, Office of Emergency Management

Photography—MISS JACKIE MARTIN, Photograph Editor, *Chicago Sun*

Motion Pictures—MR. ARCH MERCEY, Office of Government Reports, Executive Offices of the President

Propaganda—MR. HARRY W. FRANTZ, Director, News Section, Office of the Co-ordinator of Inter-American Affairs

Section V—EDUCATION AND COMMUNITY AGENCIES

Presiding: DR. META GLASS, President, Sweetbriar College

Changes in Public Education Administration—MISS BESS GOODYKOONTZ, Assistant Commissioner, U. S. Office of Education

Social Welfare Services—MISS JANE HOEY, Director, Bureau of Public Assistance, Social Security Board

Defense Housing—MR. JOHN IHLDER, Executive Officer, D. C. Alley Dwelling Authority

Vocational Rehabilitation—MISS TRACY COPP, Regional Representative, Division of Vocational Rehabilitation, U. S. Office of Education

Recreation—MR. MARK MCCLOSKEY, Director, Recreation Service, Office of Defense Health and Welfare Services

Social Protection and Law Enforcement—MR. HUGH CLEGG, Assistant Director in Charge of Training and Inspection, Federal Bureau of Investigation

12:30 LUNCHEON

Presiding: DR. LUTHER GULICK, National Resources Planning Board

TRENDS AND PLANNING FOR THE FUTURE ECONOMIC DEVELOPMENT

MR. A. FORD HINRICHS, Acting Commissioner, Bureau of Labor Statistics, U. S. Department of Labor

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2:00-4:00 ROUND TABLES

Section VI—TRANSPORTATION AND COMMUNICATION

Presiding: HON. JOSEPH B. EASTMAN, Director of Transportation, Office of Defense Transportation

Railroad Transport—MR. CARLTON J. CORLISS, Public Relations Office, Association of American Railroads

Motor Transport—MR. TED V. ROGERS, President, American Trucking Association

Air Transport—MR. FOWLER W. BARKER, Assistant Director, Air Transport Association

Water Carriers—MR. GUY E. NEEDHAM, Director, Division of Personnel, U. S. Maritime Commission

Communications—HON. RAY C. WAKEFIELD, Commissioner, Federal Communications Commission

Section VII—HOME ECONOMICS

Presiding: MISS HELEN W. ATWATER, Former Editor, *Journal of Home Economics*

Public Schools—DR. MURIEL W. BROWN, Consultant, Family Life Education, Home Economic Educational Service, U. S. Office of Education

Commercial Work Including Research—MISS MARIE SELLERS, General Foods Corporation

Community Services (Public Health and Social Welfare)—MISS MARJORIE HESELTINE, Consultant in Nutrition, Children's Bureau, U. S. Department of Labor; Former Chairman, Social Welfare and Public Health Department, American Home Economics Association

Consumer Education—MISS INEZ LE BOSSIER, Office of Price Administration

Institutional Management—

Extension Services—See publications of Institute of Women's Professional Relations

4:00 GENERAL SESSION

SUMMARY OF CONFERENCE FINDINGS AND OPPORTUNITY FOR QUESTIONS

Panel Chairman: HON. ARTHUR S. FLEMMING, U. S. Civil Service Commissioner

MR. JOHN J. CORSON, Director, Division of Employment Security, Social Security Board

MR. ROY F. HENDRICKSON, U. S. Department of Agriculture

MISS JANET HOOKS, Research Assistant, Women's Bureau, U. S. Department of Labor

MRS. LUCILLE PETRY, U. S. Public Health Service

MRS. CHASE GOING WOODHOUSE, Director, Institute of Women's Professional Relations

MR. EDGAR B. YOUNG, Personnel Office, U. S. Bureau of the Budget

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Merchandising—Miss Elizabeth Westgate, Bloomingdale's, New York City

Law—Miss Dorothy Straus, New York City

Material Conversion—Mr. Harvey A. Anderson, Chief of Conservation and Substitution, Bureau of Industrial Conservation, War Production Board

Section II—OCCUPATIONS RELATED TO HEALTH

Presiding: Dr. Warren F. Draper, Assistant to the Surgeon General, U. S. Public Health Service

Medicine and Surgery—Dr. Sara Jordan, Chairman, Women's Committee on Defense Assignment and Procurement, American Medical Association; Gastro Enterologist, Lahey Clinic, Boston, Massachusetts

Psychiatry and Psychiatric Social Work—Dr. Winfred Overholser, Superintendent, St. Elizabeth's Hospital

Nursing—Miss Alma Haupt, Nursing Consultant, Health and Medical Committee, Office of Defense Health and Welfare Services

Medical Research—Dr. R. E. Dyer, Director, National Institute of Health

Nutrition—Dr. Helen S. Mitchell, Chief Nutritionist, Office of Defense Health and Welfare Services

Pharmacy—Dr. E. F. Kelly, Secretary, American Pharmaceutical Association

Occupational Therapy—Mrs. John A. Greene, Director, Boston School of Occupational Therapy

Public Health Occupations Other Than Medicine—Mr. G. St. John Perrot, Chief, Division of Public Health Methods, National Institute of Health

Dentistry—See publications of Institute of Women's Professional Relations

Section III—SCIENTIFIC SERVICES

Presiding: Dr. Leonard Carmichael, President, Tufts College; Chairman, Committee of Scientific Wartime Requirements

Research and Teaching—Dr. Joseph Morris, Tulane University; Director, Office of Scientific Personnel, National Research Council

Physics and Electronics—Mr. George W. Bailey, Special Assistant to the Chairman of N. D. R. C.; Chairman, Radio Section, Office of Scientific Research and Development

Chemistry—Dean George W. Case, School of Engineering, University of New Hampshire; Acting Director, Engineering, Science and Management Defense Training, U. S. Office of Education

Dr. Harrison E. Howe, Editor, *Industrial and Engineering Science*, American Chemical Society

Engineering—Dr. Joseph W. Barker, U. S. Navy, Office of Procurement of Scientific Men; Dean of Engineering, Columbia University

Psychology—Dr. Ruth Tolman, Former Senior Psychological Examiner, Los Angeles, Probation Department; Chairman, Sub-Committee on Services of Women Psychologists, National Research Council

Personnel Recruitment—

Public—Dr. Leonard Carmichael, President, Tufts College; Chairman, Committee of Scientific Wartime Requirements

Private—Dr. George Beach, E. I. du Pont de Nemours and Co., Inc.

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Institute of Women's Professional Relations

A RESEARCH AND SERVICE ORGANIZATION
FOR THE COLLECTION AND DISTRIBUTION OF
INFORMATION ON OCCUPATIONS FOR MEN AND WOMEN

OBJECTIVES

To serve as a clearing house for information on women's work and education

To reduce the cost to business and industry of "training on the job" by providing information to help in the choice of a career and in the training for it, thereby eliminating the trial and error period often so costly to the employer and employee

To indicate the relation of college, professional, and other courses to particular occupations

To advise with groups and individuals in planning conferences, research, curricula, etc.

To carry on research so that these objectives may be realized

SERVICES

Distribution of information on occupations through college personnel officers, college and high school deans, and teachers of economics, sociology, and civics in high schools, colleges, and universities

Lectures and round table discussions for undergraduates, civic groups, business groups, and other organizations of men and women

Answering personal requests from students and student organizations, parents, teachers, writers, program chairmen, and from other men and women interested in occupations

Try-out programs of summer work for college junior and senior women

SUPPORT

The Institute depends for its support on private funds. Believing that the work is of interest and value to employers, educators, and parents as well as to students and to business and professional women, it is asking individuals in all these groups to become members.

Checks should be made payable to the Institute of Women's Professional Relations and mailed to 751 Williams Street, New London, Connecticut. Gifts are deductible on Federal income tax returns.

For Further Information Address

MRS. CHASE GOING WOODHOUSE, Director
Institute of Women's Professional Relations
Research Headquarters, Connecticut College, New London, Conn.

INSTITUTE of WOMEN'S PROFESSIONAL RELATIONS
MEMBERSHIP BLANK

I enclose (check) (cash) (pledge) for $..... for membership in the Institute of Women's Professional Relations.

Name .....

Address .....

Subscribing membership	$ 5.00	Sustaining membership	$ 25.00
Organization membership	100.00	Donor	100.00
Junior organization membership	$25.00		

I enclose check for $3.00 for the Proceedings of the Conference on War Demands for Trained Personnel

Name ..... Title.....

Address .....

Please mail this blank to the Institute of Women's Professional Relations, New London, Connecticut. Subscriptions are deductible on Federal income tax returns

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THE FOLLOWING COPIES ARE THE BEST AVAILABLE

LEGIBILITY IS DIFFICULT IN THE ORIGINAL DOCUMENTS

Education—Community

Study Foods

1930 - decrease 9% in college enrollment
" 5-2% [illegible]
[illegible] in industrial areas
[illegible] in [illegible] areas
[illegible] of pop. [illegible] or schools.
9 a. Kan. Minn. No [illegible] districts
La. Tenn. Ky Va. [illegible]
[illegible]
Counsellors [illegible] officers [illegible]
nursery teachers [illegible]
50,000 children [illegible]
school health [illegible]
health instruction hygiene teachers
[illegible]

Dairy 10 [illegible] funded [illegible]
39 [illegible] in [illegible]
shortage of [illegible]
residence requirement [illegible]
potential shortage 3000
1/4 of [illegible]
[illegible] not recommended
[illegible] opp. in field
vacancies for beginners $75-100 a month
do not require prof. educ.
prof. educ. for social work is expensive
$250-375 tuition (not [illegible])

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Copp -
greater opp. in State board,
which are in charge of the
operating program -
- case supervision 3 yrs exp
- case work
only few state directors 2 yrs exp
in charge of
25% professional are women
personal training conference every 2 years

Holden public housing
[illegible]
interbureau personnel [illegible]
families served under are served
housing manager, specialist in social as well
property management [illegible]
[illegible] maintain pop at least [illegible]
[illegible] acceptable [illegible] cost, [illegible]
[illegible] minimum [illegible]

Hechinger Jr. [illegible] = recreation [illegible]
recreation $12.00 - 18.00.
confusion - CB standard, too high
administration - how [illegible] right person
group organizers
technical leadership
[illegible] therapists - greatly increased
community organizers - [illegible]
Housing - OCD asst director in each state
CB - [illegible] regional office has [illegible]
SS - 76 [illegible]
[illegible] 1 or 2 [illegible]

Clegg FBI [not under CS] college grads
no W. are "Special Agent" lawyers or accts or language
60% of pop. covered in Crime report
- some of the work W could do
but not all of the work can W do as
have men
- fr. chem, physicists, doc idents
- clerical
"under-clerk" no opp. but hs educ.

- social protection section - [illegible]
venereal disease in armed forces
& adj areas

30 on staff now - [illegible]
1/3 are women
mostly in field
basis - segregation not indirect
supervision effective
may act, not yet be invoked
make it a federal crime

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Remaining

75,000 acres to be placed
in 4 months ahead

Recent [illegible] sample study
of Remington set up [illegible] needs
[illegible] delivery

Need in addition [illegible]
needed now = 6 months
for Remington set up needs

Rest of 1942 - [illegible] 1943
36,000 needed
-18,000 would be at previous level
5,000 would be filled by [illegible]
Now - prior to [illegible] statement
no [illegible]

admin. - 38,000 - 1000 at [illegible]
1000 at [illegible]

clerk. 11,000 [illegible] at [illegible]
expansion 6,000 at [illegible]
[illegible] 6,000 at [illegible]
[illegible]

continuing need

Davenport
most notable example
in aircraft [illegible]
is 11% [illegible]

12,000 [illegible] surveyed
skills badly needed

McSherry
ordnance industry
500,000 employees

non-unrolled
Greenville 168,000
Supply 200,000
[illegible] 80,000
up-grading
plants

engs 22,000
7000 fr
156 w

med 3400
1900 fr
2000 w

physics 335 fr (acute)
and [illegible] 63
courses other than 75 w

radio
sound
elec
phys. optics

misc 370 fr
269 w

Sci. meteorology - courses needed
acute

tech & sci aide
radio
chem
physics
metallurgy
fuel

more emph on lab work

Orient sci
econ. fr + grad work
commodity, for. trade. price
+ acct. stat
see more tr. in report writing

fr admin tech.
w can, will be, [illegible]

personal ass't - [illegible]
15 hrs pers adm
knowledge of oce. info, energy [illegible]
[illegible] assignment
of little value for the
personnel work

translators

inspectors, - many women followed

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Westgate merchandise Bloomingdale's

buyer. colleges give prod course.
assistant - in retailing
managers may be women
- now in furniture
important to buy any where for store
u will be divisional advertisers.
publicity most diff to break into
display.
mfg - credit div good opp for w.
mgt: 2/3 of people in store
adjustments - mail order, wrapping
admin - selling supervision
personnel - labor policies. laws, wages
teach supervisors & deal with
those who fear, family
[heal & dumb or Hollerith machines
objective point of view wd necessary
than 1/3 like people.
courses - psych very important
speech - bus arith - salesmanship
textiles, color, design, computing or the
law, positively individualistic
Strauss nearly all admit u
(not sectarian, not Harvard,
don't latter has woman teacher who
has research title!)
better to know somebody than to
know something.

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Powers Science Research assoc. Job in Banking

major activities of bank

1. defense bonds
   30,000 staff members in banks
   no commission either
2. Population W - more effective
   reserve for rainy day
   drain off inflation
3. foreign funds - page or bed
4. defense industries - finance
5. finance food for freedom
   money to farmers' cooperatives
   this year

Income 40% in 1941

[illegible] 20-60% in defense areas (100)

will take 50,000 replacements next year

so down to 15,000 [illegible]

for most pretty well [illegible]

now [illegible] - [illegible] include

30% of staff are now women

[illegible] up to 60% before [illegible]

[illegible] for women - variety

[illegible] - [illegible]

t.s. 50-75 a month 10 classes free

senior clerical - librarian - acct. clerk

punch. asst. - tel ops

currency cage - etc

bookkeeper - 10 blinds

stenographic -

tellers - [illegible] customer

(100-150 a month) contact line

65,000 w in banks - 15% total empl

may be 50%

no prior to 1917, 2-3000 w in banks

Dooley

riveter - 10 mos days can be taught in

Sperry gyroscope - without exp. - [illegible]

Douglas airplane co.

welders on pipe line can do

fine welding on airplane [illegible]

airplane plants so fast - diff. [illegible]

to train men to read blueprint

women can be trained in [illegible]

drawing - [illegible] (place

[illegible] at drawing) - change

blueprint into [illegible]

pictures

* Douglas, Tulsa

assemble by photographs not

by blueprints.

Stop letting them learn, instruct them

Thompson Prod. - Cleveland

40% will be w. [illegible]

total 10 fold increase

Orange, Tex. Shipbuilding yard

1500 mechanical employees

no more than 100 had [illegible]

built up itself. [illegible]

Lockheed - Burbank 18,000 employees

17,000 [illegible] of school [illegible]

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Hathcock - Econ & Stat

10,000 approx. in normal times

2 fields not inseparable

2600 - unassembled

- bus. conditions
  income & wealth
  econ theory
  " hist
  price
  money & bnkg
  intl trade & finance
  investment "
  corporation "
  industry studies acct
  public finance
  govt & of bus
  pub util
  transp
  land econ
  housing & constr
  regional studies
  labor econ
  social insurance
  cons. problems
  pop " (rural life)
  marketing
  commodity
  firm mgt
  fisheries forest minerals

Summary of problems of today's farmers as related to work

crop estimates

26

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Home Economics related in adult education

schools - cooperative services - research - bus.

Brown

20,000 h.e. teachers in public school - w

2 million students - boys + girls

500,000 adults ch in out-of-school

socialization in field - not subject alone

old jobs being done in new ways.

emotional maturity - personal flexibility

more supply in this field

more comfy into field

Sellers

"h econ in business" - pamphlet

450 are in business - equipment

food - home service - journal - restaurants, tea room, cafeteria

co. - in public (and supply m w)

consul. dietic. - equipment - no expansion)

- A Survey of Jobs now "held" by Women

in Food Prod. Ind. Springfield Ill Dept of Public Inst

- Mademoiselle - last issue.

positions for girls. salary offs. Prod.

- Home service volunteers - Gas Assoc. 15¢

Wash Exchange

"promotional mind" agile - flexible

35-30-45 a week, first 4 or 5 years

rest depends on special interest they have.

170 will make. Salaries are not high here.

Heseltine research equipment being set aside

welfare agencies consultant +

h econ. family welfare society - on family budgets

nutritionist - health agency

dietitian - low cost meals. institution

15 in BHWS $2600-3500

Le Bossier prices on sheets, canned goods.

most of home - new home skills perhaps

standards - specification. [illegible]

women workers & supervisors in army plants

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General session

Corson

Bridgeport - more jobs - no people
Norfolk - more people - no jobs
[illegible] aircraft [illegible]
total [illegible] needed in aircraft
skyline [illegible] - labor more [illegible] than
use the [illegible]

Henderson - McMillan (Ag na Market
[illegible] applied

Young - personnel not field
shortage in admin field

Peters - nurses under Public Health

Ill supt of Public Instruction
pamphlets

Glenn Martin

27,000 plant people
among 30-40,000 employees
aero. engrg, engrg, analysis
prod. planning
labor control - cost
simplification
AB
[illegible] inspection engineer
test engineer
enlargement work - w can
safety engrg
photograph
intercom all

General session

Texas Co.

locate oil, bring it up,
move it & refine it, move
it - heavy accs.
Personnel. a few male stenographers
travel with sales reps & [illegible]
girls - messengers - [illegible]

Firestone - wanted institutions
continue pg. work

Chem dept of F
w confined chem. to
gen'l science & [illegible]
w chemist - stable analytical
chem
"prohibition analysis"
1 semester w [illegible]

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Sci sessions

Tolman · psych-

psych test prog

local dept

placement

volunteer work

Beach · Dupont

indiv

in lune involun studies

only i.e. in Dr Gilbreth

Gilson dir

unions less of a field for women

Jewe w in 41 than in '21

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Oct. 21, 1942.

ENGINEERING AND ALLIED PROFESSIONAL WORK

Elsa Gardner. Asso. Aero. Engr., Bureau of Aeronautics, Navy Dept

* Mrs. Mabel McFerran Rockwell, Production Engineer, Lockheed Aircraft Plant
408 S. Spring St., Los Angeles, California

Miss Mary Elizabeth Miller, Engineer, Glenn L. Martin, Baltimore, Maryland

Margaret Ingels, Carrier Corp., Syracuse N.Y. (air conditioning) (First woman in U.S. to get mechanical engineering degree, Univ. of Ky.)

Mrs. Ruth Wallgren, Westinghouse Elec. & Mfg. C o. (drafting of finished designs of turbines) (Enterprise-Beaumont, Texas, 1/21/42)
She also draws gun carriages, howitzers and dreadnaughts.

Miss Olive M. Dennis, Baltimore, Md., Engineer of Service B & O R R
(Only woman engineer employed by a railroad to ride its lines and suggest changes in equipment and service designed to make passengers more comfortable.)

Catherine Ferguson-tests sample bars of new alloys for General Electric, Schenectady, N.Y. (One of her testing machines is the flywheel into which the alloy bar is fitted, rotated at 2400 r.p.m. and then struck with a hammer to test its resistance and strength.) (Graduated from Northwestern University. Studies engineering and metallurgy at night school to fit her for this job.)
(Times, N.Y.C. 12-5-41)

Emily T. Hannan, Head of Turbine Calculations Dept., General Electric, Schnectady, New York.

Also at this plant are: Marie Te Richardson, Graduate Engineer
Isabel Lyons, Graduate Architect
General Electric *Edith Clarke, Electrical Engineer

Miss Laura Garrison (Has suggested improvements in machinery and processes to speed up production. Awarded $350 recently for an improvement of radio transmitter part. Has netted $500 in such bonuses. Has made 27 suggestions to company 17 of which have been adopted and 3 pending.) (Herald-Tribune, N.Y. 7/25/42)
(New York Times, 8/17/42)

Other Laboratory Workers

Women are employed as chemists, physicists, engineering aides, etc., in the laboratories of various industrial firms of which the following are a few examples:

American Telephone & Telegraph Co.
General Electric Co.
Standard Oil Co. of New Jersey
Oil refineries in the San Francisco Bay area
Goodyear and Goodrich Rubber CO's of Akron, Ohio
Carbide and Carbon Co. of Charleston, W. Va.

Names of a few women: Chemists
Lois Hans, chemical engineer for Hercules Powder Co. (Hercules Powder C o. News Bureau)

Lura Short, research chemist in charge of technical library for Hercules Powder Co. (In last war was one of only a few women chemists).

* These 2, plus Virginia Kellerno, only 3 women members of the Inst of Aero Sci, May 1942

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Other Laboratory Workers: (continued)

Dr. Elizabeth Osman, research chemist doing experimental work for Hercules Powder Co. (Hercules Powder Co. News Bureau)

Dr. Donna Price, experimental work for Hercules Powder Co. (Hercules Powder Co. News Bureau)

21,000 Women on Roster Of Specialized Personnel

The National Federation of Business and Professional Women's Clubs, Inc., is cooperating with the War Manpower Commission in its National Roster of Scientific and Specialized Personnel, Dr. Minnie L. Maffett of Dallas, president, announced yesterday.

The National Roster now has listed 500,000 specially trained persons. Exclusive of medicine and dentistry, 21,000 are women. Of these, 8,000 list themselves as concerned with social welfare. The federation is cooperating in attempting to obtain the names and fields of specialization of as many professional women as possible.

Dec 26/42

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X-6463

ADVANCE RELEASE

ADVANCE RELEASE: For TUESDAY AFTERNOON PAPERS, November 24, 1942

OFFICE OF WAR INFORMATION
WAR MANPOWER COMMISSION

WMC--ORR--2037 PM-4160

Following recent increases in demand for technically-trained personnel, the National Roster of Scientific and Specialized Personnel today urged senior and graduate students of chemistry, physics, engineering, and other specialized fields to register their skills. The principal national professional and scientific societies are constantly cooperating with the National Roster to stimulate complete registration in their respective fields.

The National Roster, a part of the War Manpower Commission, now has listed and punch-card-indexed approximately 550,000 names in more than 60 specialized occupations. These fields cover every technical activity from genetics and geophysics to housing and radio broadcasting. The Roster is a compilation of the nation's technical manpower resources, for such use as the critical war emergency may demand.

Names on file include scientists of such international fame as Albert Einstein, physicist; James Bryant Conant, president of Harvard University; Karl P. Compton, president of Massachusetts Institute of Technology; David Sarnoff, president of Radio Corporation of America; Igor Ivan Sikorsky, aeronautical engineer; Charles Franklin Kettering, head of National Inventors Council. It also includes the most recent college graduates in various scientific courses. Constant efforts, moreover, are made to list all people with technical training, even though their skills may not have been used in recent years.

Registration with the Roster is not to be considered application for employment. Many who have filled out the questionaires are now at work in their chosen professions. Many of those registered have received offers of employment. Acceptance of such offers is optional with each individual registrant. In the past twenty months 140,000 men and women have been referred to prospective employers of specialized personnel, particularly for war production and research. Methods will shortly be inaugurated whereby the Roster will maintain a check on the results of its recommendations.

Close cooperation is maintained between the Roster and the local offices of the United States Employment Service. Various industries needing technicians are now consulting local USES offices for information about available chemists, engineers, accountants, statisticians, and scores of other specialists.

The National Roster is constantly used to advise local Selective Service boards through National Headquarters regarding the importance of work now being done by civilian technicians of draft age.

The overall information of the Roster is used as a basis to determine shortages in any technical field; to supply needed professional and scientific personnel for the armed forces, war industry, and Governmental agencies.

To register with the Roster, a man or woman with scientific or other specialized training should write to Dr. Leonard Carmichael, Director, National Roster of Scientific and Specialized Personnel, War Manpower Commission, Washington, D. C., mentioning the field or fields in which he or she has training or knowledge.

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FAMILY ECONOMICS BUREAU
NORTHWESTERN NATIONAL
LIFE INSURANCE COMPANY
O. J. ARNOLD, PRESIDENT
MINNEAPOLIS, MINNESOTA

May 24, 1942.

MARKET FOR COLLEGE GRADUATES REFLECTS WAR TRANSITION

Demand from Civilian Industry Shrinks as Jobs in War Industries Multiply; More Opportunities for Women, for Graduates with Dependents, and for Physically Handicapped Students

Changes due to the war effort dominate the picture of this seventh annual survey of the employment market for the current graduating class. In general, demand from civilian industry is shrinking, and the call for new personnel in war industry is growing rapidly. From 50 per cent to as high as 90 per cent of the male graduates in various schools will be entering the armed forces of the country shortly; for those remaining, particularly for those who have deferred draft status, there are from three to ten jobs per graduate, with war industries and government agencies furnishing most of the jobs. The resulting scarcity has shot starting salaries up to record heights, 10 to 50 per cent over 1941 levels.

Naturally there is a big increase in the demand for women graduates, also for married graduates who have children or graduates with other dependents, and for those with physical handicaps, in other words, for those with deferred draft status and therefore a promise of permanency in their jobs.

Numerous large corporations which have heretofore offered thousands of openings for promising graduates in sales and service jobs involving extensive training courses, have partially or completely discontinued such courses and such recruiting. Sales opportunities are scarce. There are many more technical jobs than there are available graduates. Women are being accepted for technical and management opportunities hitherto exclusively the province of male graduates.

Because of space limits, this summary quotes only part of the reports received, but effort is made to select from each locality a number of comments which seem truly representative of conditions in that territory.

Different schools estimate employment proportions on various bases - some as a percentage of the entire graduating class, others as a percentage of all seniors seeking employment, and still others on a basis of those seeking placement bureau assistance. Also varying proportions of different graduating classes will enter the armed forces. Though these variations preclude exact comparisons, general trends are clearly shown.

The East

BOSTON UNIVERSITY (College of Business Administration) - Early spring calls for graduates came, as usual, from large companies with organized training programs. But with rapid changes in military service requirements, such companies delayed further interviewing because of unsettled conditions. Some 50% to

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55% of our graduates are either already enlisted or will enter military service soon after graduation; nearly all remaining graduates seeking employment will secure jobs, at starting salaries up 5% to 10% from last year. Cannot supply the demand for women graduates. Industrial management and accounting are taking most of our available graduates.

COLUMBIA UNIVERSITY - Fewer employment calls except for engineers, statisticians, and economists, chiefly because many companies have stopped recruiting for trainee programs. Approximately 75% of our men graduates will enter military service; all remaining available for employment will secure jobs, at starting salaries 10% to 15% higher than last year. Greatly increased call for women graduates. Bulk of jobs now available are in war industries, with many more graduates going into government service in Washington.

NEW YORK UNIVERSITY - Over 100% increase in employment calls in technical, scientific, accounting and management fields; some falling off in the field of distribution. Starting salaries increased $10 to $20 a month in base pay; overtime adds about 20% more. At least 50% of our men will enter military service; all remaining graduates who are available will secure jobs, principally in war industries. Steadily increasing demand for women graduates, with improvement in salaries.

NEW YORK UNIVERSITY (College of Engineering) - Employment calls for engineers are about twice as great as last year with improved starting salaries. Not over 25% of our men graduates will enter military service as engineers are too badly needed in the war industries; all not entering military service will be readily placed.

FORDHAM UNIVERSITY - Employment calls up 300% over last year; starting salaries average 50% better. Some 80% of our men will enter military service; all remaining graduates seeking employment will secure it, mainly in war industries.

HARVARD UNIVERSITY (Graduate School of Engineering) - It is impossible to supply the demand for 1942 engineering graduates; every one of our graduates will either be in the armed forces or employed, largely in the aeronautical industry.

YALE UNIVERSITY - Forty-six per cent of present senior class will enter military service. Expect that all the others will be employed. The non-technically trained men will be hired for technical jobs and where necessary will be given technical training on the job. Starting salaries are higher this year. Thirty-one concerns have offered jobs for men with deferred draft classification; we have only twenty-one applicants available in this classification.

PRINCETON UNIVERSITY (School of Engineering) - Heavier demand this year for graduates, with starting salaries averaging 20% higher than last year. About one-third of our men will enter military service; the remainder can select from about five employment offers per student.

DARTMOUTH COLLEGE (Thayer School of Civil Engineering) - Demand for engineering graduates much greater than last year; little change observed in starting salaries. Some 90% of our men graduates will enter military service; all those remaining will be placed, mainly in naval and construction work.

DARTMOUTH COLLEGE (Tuck School of Administration and Finance) - War industries will absorb all the graduates we can supply, at generally higher starting salaries, running from $1,800 to $2,000. Some 94% of our men graduates will enter military service.

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY (School of Engineering) - Total number of employment calls greater than last year although 25% fewer companies are in the market. Minimum starting salaries are $15 to $20 higher than in 1941. Approximately 42% of our men will enter military service; of seniors graduated April 27th, 97% are already placed. Bulk of our graduates are being absorbed into aeronautical, petroleum, chemical, machinery, tool and instrument, electrical equipment, ship building, and steel industries.

CORNELL UNIVERSITY (School of Mechanical Engineering) - Demand very much greater than last year with starting salaries up about 10%. Approximately 44% of our men graduates will enter military service; all of the remainder available for employment will be placed, mainly in aeronautical, electrical manufacturing, construction, and production industries. Marked increase in demand for women graduates, for married graduates, and for physically handicapped, either men or women.

UNIVERSITY OF MAINE - Employment calls much increased for engineers and for women graduates, but not for draft-eligibles. Starting salaries up a minimum of 20%, in some cases much more. At least 70% of our men will enter military service; all remaining graduates seeking employment will be placed, with exception of those likely to be drafted soon. Present has opened new opportunities for physically handicapped; also has increased calls for married graduates. War industries and civil service will absorb most of our available graduates.

BOWDOIN COLLEGE - Employment calls increased 25% to 50% over last year; about 75% of our men will enter military service; all remaining graduates seeking employment will be placed.

UNIVERSITY OF VERMONT - Employment demand much greater; starting salaries average 15% higher than last spring. About 90% of our men graduates will enter military service; all remaining graduates seeking employment will be placed, in war industries.

BROWN UNIVERSITY - Most of our seniors entering some branch of army or navy; for those able to take reasonably permanent industrial jobs, starting salaries are generally better. Our graduating engineers can usually select from three or four different openings available for each man.

RHODE ISLAND STATE COLLEGE - Employment calls substantially greater this year with higher starting salaries; about 50% of our men graduates will enter military service; all remainder seeking employment will be placed, mainly in defense industries and in teaching positions.

UNIVERSITY OF NEW HAMPSHIRE (College of Technology) - Employment demand far in excess of 1941, at starting salaries 20% to 50% higher. About 50% of our male graduates will enter military service, nearly all of these through R.O.T.C. All remaining graduates available for employment will be readily placed.

CLARKSON COLLEGE OF TECHNOLOGY - Five times as many employment calls as last year; starting salaries average $170 a month, compared with $150 last year. Between 20% and 30% of our men graduates will enter military service; all remainder will be placed, mainly in aircraft, instrument and tool, chemical, and heavy industries.

RENSSELAER POLYTECHNIC INSTITUTE - Employment demand many times greater than last year, at considerable higher starting salaries. Exactly 50% of our seniors at the present time plan to enter military service; this proportion will un-

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doubtedly increase. All remaining seniors will secure jobs. Although we have never admitted women students, we are now receiving a constant flow of requests from business for women employees.

COLGATE UNIVERSITY - Demand definitely off, but number of graduates not entering military service is so low that we do not have enough to fill the demand. Starting salaries are higher by $5 to $10 a month. Approximately 95% of our male graduates will enter military service. Demand for married graduates is definitely up, and physically handicapped are much in demand. Sales opportunities have disappeared. Could place any number of men in defense industries, but draft will not grant them deferment. A great many graduates who are entering military service will not be called up until September or October. It would seem that here is a sizable reserve of man power available during the summer months that could be used productively in some way.

ALFRED UNIVERSITY (Department of Business) - Employment calls 20% greater than last year; starting salaries 10% higher. About 20% of our men graduates will enter military service; all remainder who are available will be placed, mainly in industries supplying war materials or in civil service. All women graduates and all married graduates who desire work can be placed.

LEHIGH UNIVERSITY - Employment calls for engineers much greater than last year, but demand for business administration and arts and science seniors much less, due to their prospects for early draft. Starting salaries higher this spring. About 30% of our engineers will enter military service. All remaining engineers have already been placed in positions, practically all of them in industries doing war work.

CARNEGIE INSTITUTE OF TECHNOLOGY - Increased demand for engineers this year, with salaries up approximately $10 a month. Some 47% of our engineering seniors will enter military service; all remainder seeking employment will be placed, chiefly in aircraft, chemical and allied products, machine manufacturing, steel and nonferrous industries, and construction. Increasing demand for women, for married graduates, and for physically handicapped.

DREXEL INSTITUTE (School of Engineering) - Demand this year is several times greater than in 1941, with starting salaries approximately 10% higher. About 30% of our men will enter military service; all remaining graduates available will be placed. Much greater market for women graduates, especially in the technical fields; a noticeable demand for physically handicapped. Placement of graduates will be almost entirely in defense industries, chiefly aircraft, army and navy ordnance plants, powder and explosives, and radio and electronic equipment.

UNIVERSITY OF PITTSBURGH:- Demand for engineering graduates up 30%, for business graduates off 60%. Starting salaries are up 20% to 30%. Probably 70% to 80% of our men graduates will enter military service. Practically all graduates available for employment will be placed, chiefly in war industries. Much greater demand for women graduates, and in more capacities.

TEMPLE UNIVERSITY - Employment calls are 31% above last year; starting salaries are up 10%. Over 50% of our men will be in military service by the end of the school year; all remaining graduates seeking employment will be placed. Many new opportunities available for women now, which were not considered their field before the outbreak of the war, such as in gas welding, implement making, assembling airplane parts, claims investigation, gauge checking, insurance

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adjustment, drafting and blueprint reading, as economic technicians and as engineering aids. Demand for secretaries, accountants, physicists, chemists, and those qualified in mathematics is far beyond our ability to supply.

VILLANOVA COLLEGE - Fewer applications from students for help in finding positions this year than in any other year on record; about 60% will enter military service; remainder will probably be placed in civil service jobs.

UNIVERSITY OF DELAWARE - Employment demand greater this year, with higher starting salaries. About 50% of our men graduates will enter military service; all remaining graduates seeking employment will be placed, in engineering, teaching, agriculture, chemistry, and oil industries. Much greater demand for women graduates, and in new fields not formerly open to them.

UNIVERSITY OF DELAWARE (School of Engineering) - Much greater demand for engineers this year, at higher starting salaries. At least 70% of our men will enter military service; all the remainder already have jobs mainly in essential defense industries.

JOHNS HOPKINS UNIVERSITY (School of Business Economics) - Many more calls for graduates this year, at higher starting salaries. Nearly all our men will enter military service; all remaining graduates available for employment will be placed.

JOHNS HOPKINS UNIVERSITY (School of Engineering) - Large increase in demand, with starting salaries higher by 40%. About half our men will become commissioned officers after graduation; all remaining available will be placed, mainly in war industries.

UNIVERSITY OF MARYLAND (College of Engineering) - Many more calls for graduates this year, at better starting salaries. About 80% of our men will enter military service immediately on graduation; all remaining available graduates will be placed, mainly in war industries. Great demand for women graduates.

South

VIRGINIA POLYTECHNIC INSTITUTE - Demand for technically trained graduates much larger this year, with starting salaries about 10% higher. Approximately 90% of our men will enter military service; remaining graduates available for employment will all secure it, chiefly in electrical manufacturing, steel, chemical and aircraft industries. We have many calls for women, especially for typists and laboratory workers. Sharp increase in demand for physically handicapped.

UNIVERSITY OF VIRGINIA (College of Engineering) - Considerable increase in employment calls compared with last year; starting salaries up about 10%. Approximately 25% of our men graduates will enter military service; all remainder seeking employment will be placed, chiefly in chemical industries, steel, and in electrical manufacturing industries, and in TVA. Find greater demand for women, and for physically handicapped.

UNIVERSITY OF RICHMOND (College of Commerce) - Fewer employment calls but starting salaries are higher. Majority of our men graduates expect to enter military service.

WEST VIRGINIA UNIVERSITY (College of Engineering) - Much greater demand this year, with starting salaries 25% higher. About 20% of our men will enter military

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service; all graduates seeking employment will be placed, mainly in chemical, steel, glass, and other heavy industries, also in civil service. Improving market for women graduates, for married graduates, and for physically handicapped.

UNIVERSITY OF KENTUCKY (College of Commerce) - Employment calls at least double last year's with starting salaries 20 to 30% higher. From 60 to 70% of our men will enter military service shortly after graduation. Sufficient offers for employment coming in to take care of all remaining available graduates, not subject to early draft. Sharp increase in demand for women, including many jobs that previously were held by men. Receiving many requests for married men and for men with physical handicaps.

VANDERBILT UNIVERSITY (School of Engineering) - Much greater demand for graduates, starting much earlier in the year, with beginning salaries running about 40% higher than last spring. About a third of our men will enter military service; all remaining graduates available for employment will find jobs available in various industries engaged in war production.

UNIVERSITY OF TENNESSEE - Number of employment calls up 30% and starting salaries up 20% over last spring. About 85% of our men will enter military service; all graduates available for employment will secure it. Great increase in market for women graduates; increased demand for physically handicapped.

UNIVERSITY OF NORTH CAROLINA (College of Agriculture and Engineering) - Employment demand several times that of last year, at higher starting salaries. About 70% of our men graduates will enter military service; all the remainder who are available already have jobs and are being graduated one month earlier than usual.

UNIVERSITY OF SOUTH CAROLINA (School of Engineering) - At least ten times as many employment calls as last year with starting salaries about 50% higher. Some 25% of our men graduates will enter military service; remainder are already placed with additional calls coming in. Definite preference for women draftsmen and women engineers, also for married graduates with dependents and for handicapped graduates. Structural, aircraft, hydro-electric, and chemical industries furnishing most of openings.

UNIVERSITY OF GEORGIA - Much greater demand, with higher salaries for most positions. All our June graduates not entering military service will be placed.

UNIVERSITY OF ALABAMA (School of Engineering) - Demand for graduates at least tripled with starting salaries a good 25% better. About 70% of our men will enter military service; all graduates available for employment will be placed.

UNIVERSITY OF ALABAMA (School of Commerce) - Heavy demand, though a number of firms have given up recruiting. Aviation and other production industries clamoring for applicants. New firms now offering $125 compared with $100 to $110 last year. Nearly 50% of our men will be eligible for army commissions; expect every available graduate to have at least one employment offer this year. Heavy demand for women. Graduates not entering military service will be distributed mainly in defense manufacturing and public service, particularly TVA.

MISSISSIPPI STATE COLLEGE (School of Engineering) - Number of employment calls three to five times as great as last year, with seven to ten offers per available senior. Starting salaries 60 to 80% greater than last year. About 25% of our men graduates will enter military service; all of the remainder seeking employment will secure it, mainly in manufacturing industries.

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UNIVERSITY OF MISSISSIPPI (School of Commerce and Business) - Employment demands slightly greater than last year, at larger beginning salaries. About 90% of our men will enter military service; practically all graduates available for employment will secure it. Increased demand for women, for married graduates, and for physically handicapped.

UNIVERSITY OF MISSISSIPPI (School of Engineering) - Greater demand than last year with salaries somewhat higher. About 20% of our men graduates will enter military service; remainder will be placed in TVA, army arsenals, and other war industries.

UNIVERSITY OF FLORIDA - Great increase in demand at better starting salaries, especially for engineers. Great majority of our physically-fit male graduates will enter military service; nearly all graduates available for employment will secure jobs.

LOUISIANA STATE UNIVERSITY (College of Commerce) - Fewer calls than last spring but far in excess of available supply; starting salaries increased 25%. About 90% of our men will enter military service; all graduates available for employment will secure it. War situation has greatly increased calls for women graduates, for married graduates, and for those with minor physical handicaps.

LOUISIANA STATE UNIVERSITY (College of Engineering) - Employment calls up 300% compared with last year, with starting salaries about 25% higher; some 50% of our men graduates will enter military service; remainder will be placed in industry, mainly war industries.

Central and Midwest

OHIO STATE UNIVERSITY (College of Engineering) - Several times as many employment calls as last year at somewhat higher starting salaries; 25% or more of our men graduates will enter military service; all available for employment will be placed. War has increased demand for women graduates.

UNIVERSITY OF CINCINNATI (College of Engineering and Commerce) - Number of employment calls largest in our history; starting salaries fully 25% higher. About half the senior class will be commissioned in navy or army; all of remainder will have jobs. Cannot nearly meet demand for women graduates. We are planning to train a number of women for supervisors and executive positions in war production work.

TOLEDO UNIVERSITY - Three hundred per cent increase in employment calls with starting salaries 25% higher. Some 75% of our men graduates will either enter military service, government or civil service positions. Women graduates will all find ready placement, but men other than 4-F classification will have difficulty finding jobs.

BOWLING GREEN STATE UNIVERSITY (College of Commerce) - Greater demand at somewhat higher salaries; some 90% of our men will enter military service; all remaining graduates will find employment.

UNIVERSITY OF AKRON (College of Engineering) - About three times as many employment calls this year as in 1941, with starting salaries running 50% higher. About 20% of our men graduates will enter military service; all remainder available for employment will be placed. Unfortunate competition between industry and government and between different government departments needs to be coordinated.

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KENT STATE UNIVERSITY (College of Commerce) - Employment demand at least double last year's with starting salaries 10% to 15% higher. Probably 90% of our physically qualified men graduates will enter military service; nearly all of our graduates available for employment will be placed, mainly in Akron rubber industries, in aircraft and ordnance plants and in steel industries of this area.

MIAMI UNIVERSITY (School of Business Administration) - About 20% fewer companies in the market but many more offers per company, with starting salaries 10% to 20% higher; 74% of our men will enter military service; practically all graduates available for employment will be placed. Great demand for women graduates.

XAVIER UNIVERSITY - Much greater employment demand with starting salaries highest since depression. About 65% of our men graduates will enter military service; all others will be placed.

UNIVERSITY OF MICHIGAN (School of Business Administration) - Greater demand this year; starting salaries remain about $150 per month on the average. Some 80% to 85% of our men will enter military service; all graduates available for employment are expected to be placed. Increased demand for women graduates; physically handicapped graduates now very easy to place.

UNIVERSITY OF MICHIGAN (College of Engineering) - Much higher demand for graduates, with starting salaries perhaps 20% higher on the average. Probably a third to a half of our men will enter military service; all remaining graduates available for employment will be placed, in all types of war industry. Demand for engineering graduates, young, old, handicapped, even retired, long since went out of sight. Technical man-power shortage is a major problem.

MICHIGAN STATE COLLEGE (Engineering Division) - Employment calls 50% to 100% greater this year with starting salaries averaging 10% to 25% greater and in some cases even higher. Approximately 28% of our men will enter military service; all the remainder available for employment will be placed, mainly in war production and metal industries.

UNIVERSITY OF DETROIT (College of Commerce and Finance) - About the same volume of employment calls as last year, but starting salaries average higher. At present 90% of our men graduates expect to enter military service; all graduates available for employment will be placed. Greater opportunities now for women graduates, for married graduates, and for physically handicapped.

INDIANA UNIVERSITY (School of Business) - Employment demand about the same as last year, but starting salaries run 10% higher. About 75% of our men graduates will enter military service either upon graduation or during the summer. All graduates available for employment will be placed by July 1st.

UNIVERSITY OF NOTRE DAME (School of Commerce) - Greater demand this year at slightly higher salaries. Practically all our men graduates will enter military service; all graduates available for employment can be placed.

UNIVERSITY OF NOTRE DAME (Placement Bureau) - Many more calls for technical graduates but few calls this year for non-technical men. Starting salaries up approximately 20% for technical graduates. At least 75% of our graduates will enter military service; all of the remainder can be placed.

ROSE POLYTECHNIC INSTITUTE - About one-third of our men will be commissioned in the engineering corps; all graduates available for employment were placed 60 days

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before date of graduation. Starting salaries around 20% to 30% higher than last year.

VALPARAISO UNIVERSITY (College of Engineering) - Better demand this year and better starting salaries. About 60% of our men graduates will enter military service; all those remaining available for employment will be placed. Increasing demand for women graduates, for married graduates, and for physically handicapped.

VALPARAISO UNIVERSITY (Department of Business and Economics) - Employment calls show 30% increase and starting salaries are about 15% better than a year ago. About 60% of our men will enter military service; nearly all graduates available for employment will be placed. Market for women graduates at least 50% greater.

UNIVERSITY OF CHICAGO (School of Business) - Marked increase in employment calls; starting salaries average 15% higher. Nearly all our men will enter military service; all graduates available will be placed in employment. Increasing demand for women. Many more could be employed if they were available.

DEPAUL UNIVERSITY - Much greater number of calls for women graduates; starting salaries 25% higher. All graduates seeking employment can be placed. Golden opportunity for physically handicapped.

UNIVERSITY OF ILLINOIS (College of Engineering) - Employment calls two to three times as great as a year ago with starting salaries up about $40 a month on the average. From 35% to 40% of our men graduates will enter military service; all graduates available for employment will be placed. Noticeably increased demand for women and for physically handicapped.

UNIVERSITY OF ILLINOIS (College of Commerce and Business Administration) - Greater number of calls this year at higher starting salaries. About three-fourths of our men will enter military service; all remaining graduates who want jobs will secure them. Many more jobs than usual for women graduates.

BRADLEY POLYTECHNIC INSTITUTE (Department of Commerce and Administration) - More calls, but many do not want men likely to be drafted soon. Higher starting salaries. Half to three-fourths of our men graduates will enter military service within six months. Probably all graduates remaining available will be placed.

BRADLEY POLYTECHNIC INSTITUTE - Employment calls about the same as last year, but starting salaries are higher. Most of graduates available will be placed, in teaching, and in defense industries. Improved market for women graduates.

ARMOUR INSTITUTE OF TECHNOLOGY - Greater employment market than last year at larger starting salaries. From 10% to 20% of our men will enter military service; all graduates remaining available for employment will be placed. Much greater demand for women, and for physically handicapped.

MARQUETTE UNIVERSITY (College of Engineering) - More employment calls than ever before with starting salaries up 10% to 15% on the average. About 35% of our men will enter milit ry service; all graduates remaining available for employment will be placed, mainly in heavy machinery and aircraft industries.

UNIVERSITY OF WISCONSIN - Number of employment calls about 60% less than last spring with starting salaries 25% to 30% higher. No definite data yet as to how many

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of our men will enter military service, but proportion will probably be in neighborhood of 75%; unsettled draft situation on some of others makes their placement uncertain at present time. Much better market for women graduates, for married graduates, and for physically handicapped.

UNIVERSITY OF WISCONSIN (College of Engineering) - Much greater employment market for engineers this year, at starting salaries which are 20% to 50% higher. Proportion entering military service not yet known, but all definitely available for employment have already been placed.

UNIVERSITY OF MINNESOTA (Institute of Technology) - Number of employment calls will run about the same as last year with starting salaries up $5 to $10 a month. Between 17% and 20% of our men will enter military service; all remaining graduates available for employment will be placed. Greatly increased demand for women and for physically handicapped.

UNIVERSITY OF MINNESOTA (School of Business Administration) - Greater demand this year with starting salaries 10 to 20% higher. Probably 75% of our men are entering military service; all available graduates will be placed in employment. Greatly improved employment market for women.

UNIVERSITY OF MINNESOTA (School of Science, Literature, and Art) - This department has received more employment calls than ever before, with fewer students available, most of them women. Only 22 seniors turned in applications to the placement bureau for employment this year.

UNIVERSITY OF NORTH DAKOTA (College of Engineering) - Five times the number of 1941 employment calls with starting salary increases running $50 and more per month. All graduates except R.O.T.C. men (taking commissions) have already been placed, about half of them in government employment and about half in private business.

UNIVERSITY OF NORTH DAKOTA (School of Commerce) - Much greater demand this year with starting salaries up 20% and 30%. Estimate about 75% of our men graduates will enter military service; all indications are that graduates available for employment will all be placed. Greatly increased demand for women and for physically handicapped.

SOUTH DAKOTA STATE COLLEGE (College of Engineering) - More active demand at higher starting salaries. About 30% of our men graduates are entering military service; all available for employment will be placed, mainly with big concerns doing war work.

UNIVERSITY OF NEBRASKA (College of Engineering) - Improved market for graduates, with starting salaries up 20% to 25%. About 20% of our men will enter military service and all the remainder seeking jobs will be placed. Increasing market for women graduates.

NEBRASKA WESLEYAN UNIVERSITY (College of Commerce) - Number of employment calls double this year, with government positions paying 30% to 50% more. Expect all our men (except physically handicapped) to be in military service by September. All graduates available for employment will be placed. Market greatly improved for women.

DRAKE UNIVERSITY (School of Commerce and Finance) - Number of employment calls 50% under last year, with starting salaries about the same. Approximately 50% of

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our men will enter military service; will place all of remaining graduates available for employment. Much better market for women.

IOWA STATE COLLEGE (Department of Engineering) - Considerable increase in demand, which is greater than supply. Starting salaries up on the average of $20 per month. About one-third of our men will enter military service; all graduates available for employment will be placed. Greatly increased demand for women and for married graduates, also for physically handicapped.

STATE UNIVERSITY OF IOWA (College of Engineering) - Many times more employment calls this year with starting salaries $25 to $75 greater per month. About 25% of our men will enter military service; all graduates available for employment will be placed. No difficulty in placing physically handicapped graduates this year.

UNIVERSITY OF MISSOURI (School of Business and Public Administration) - Number of employment calls much lower than last year; little increase in starting salaries for men but some accountants and statisticians are starting at $130 and $150 a month. Probably 60% to 75% of our men graduates will enter military service. Employers not interested in men not yet classified as to draft status.

UNIVERSITY OF MISSOURI (College of Engineering) - Many more employment calls this year at higher starting salaries. Possibly 20% of our men graduates will enter military service. All available for employment will be placed.

WASHINGTON UNIVERSITY (School of Engineering) - Number of employment calls more than double last year, with starting salaries considerably higher. About 20% of our men will receive R.O.T.C. commissions. All graduates seeking employment will be placed this year. Increasing market for married graduates, for women, and for physically handicapped.

WASHINGTON UNIVERSITY (School of Business and Public Administration) - Much greater employment demand this year with much improved starting salaries. Probably 75% of our men will enter military service. Entire class will either be in the service or employed. Greatly improved market for women and for physically handicapped.

UNIVERSITY OF KANSAS (School of Engineering) - Number of employment calls for engineers is 200% above last year with starting salaries far higher. About 50% of our graduates will enter military service; by March 1st all of the remainder had secured jobs to start in June.

UNIVERSITY OF KANSAS CITY - Fewer calls from private industries but more from employment services and from the government. Starting salaries slightly higher in private industry but not high enough to compete with pay rates in defense industry. Roughly about 90% of our men will enter military service; nearly all of those seeking employment will secure jobs. More opportunities for women and for physically handicapped.

UNIVERSITY OF ARKANSAS (College of Engineering) - All our men have had several offers, at very much higher starting salaries than last spring. Approximately 25% will enter military service; all the remainder will be placed, mainly in war industries.

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West and Southwest

BAYLOR UNIVERSITY - Employment demand far exceeds that of last spring. In industrial and defense work starting salaries are up probably 25%. From 75% to 90% of our men will enter military service; practically all our June graduates seeking employment will be placed. Cannot meet the demand for men and women with skill suited to defense work plants - with knowledge of chemistry, science, mathematics and accounting.

TEXAS CHRISTIAN UNIVERSITY (School of Business) - Increase in local demand but practically none from major national concerns, previously large recruiters. Starting salaries running 25% higher than year ago. All our June graduates not in military service will be placed. About 40% will be commissioned or otherwise inducted immediately upon graduation. An additional 20% will be called within the following three months. Large increase in market for women graduates, for married graduates, and for physically handicapped.

UNIVERSITY OF TEXAS (School of Engineering) - Calls for engineering graduates up 200% over last year with starting salaries $25 to $50 per month higher. About half of our men will enter military service; all those remaining available for employment will be placed, chiefly in aeronautics, communications, war equipment, ship building, and war construction industries, and in research.

TEXAS CHRISTIAN UNIVERSITY (School of Business) - Difficult or impossible to place young men of draft age in any type of position unless they are married and have at least one child or have a real physical handicap. This increases urge to enter military service. Some increase in local demand this year but practically none from major national concerns who were chief factors in market in past years. Starting salaries up 25% higher than a year ago. Aproximately 40% of our graduates are already in R.O.T.C. or deferred until June; expect additional 20% to be called within next three months. All graduates seeking employment will be placed. Great increase in demand for women. A number of local industries are making replacements entirely with women.

UNIVERSITY OF NEW MEXICO (College of Engineering) - Much greater demand this year for engineering graduates, with starting salaries somewhat higher. About 30% of our seniors will enter military service; all those remaining will be placed, in defense industries of one type or another.

UNIVERSITY OF ARIZONA (College of Engineering) - Demand for engineering graduates greatest on record. Every mechanical and electrical graduate has had an opportunity to choose between four and five offers. Starting salaries also best on record. About half our graduates have entered or will enter military service; all available for employment have either already accepted jobs or are considering offers, but unless many draft boards change their policies soon, most of these also will be in military service in the near future. Believe unless draft boards are ordered to defer engineering students until graduation, also engineering graduates employed in national defense industries, there will be practically no engineering students and relatively few juniors in college next year, and almost no engineering graduates will be available for employment in industry unless they are physically handicapped.

UNIVERSITY OF OKLAHOMA (College of Engineering) - Demand for engineers much greater than last spring, with starting salaries a little higher on the average. All our graduates will either be placed or will be called into service; approximately 50% in the latter group. Local placements in aircraft, manufacturing, and in industries related to oil and its products.

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OKLAHOMA AGRICULTURAL AND MECHANICAL COLLEGE (College of Engineering) - Employment market better this year with better starting salaries. From 30% to 35% of our men will enter military service; all the remainder will be placed.

UNIVERSITY OF TULSA (College of Commerce) - More employment calls this year with starting salaries higher. About 75% of our men will enter military service; remaining graduates available will all be placed. Better market for women, for married graduates, and for physically handicapped.

UNIVERSITY OF COLORADO (School of Engineering) - Increase in employment calls ranges from 150% to 300% depending on the department, with starting salaries 15% to 20% greater than last spring. About 10% of our men will enter military service; all of the remainder seeking employment will be placed.

BRIGHAM YOUNG UNIVERSITY (College of Commerce) - More employment calls this year; cannot supply demand. Starting salaries higher by 10% to 20%. Upwards of 75% of our men will enter military service; all other graduates available for employment will be placed. Could place more women graduates than we have available; same situation for married graduates and for physically handicapped.

UTAH STATE AGRICULTURAL COLLEGE (School of Engineering) - Employment calls far in excess of last year with salaries 25% higher. About half our men will enter military service. Improved market for physically handicapped.

UNIVERSITY OF UTAH - Employment calls 30% to 40% more than last year with starting salaries $10 to $25 a month higher. About 30% to 40% of our men will enter military service and we expect that all other available graduates seeking employment will be placed, with engineering firms, in teaching, and defense industries. Great demand for women, in teaching, business, and defense industries.

UNIVERSITY OF IDAHO (School of Business Administration) - Number of employment calls far exceeds last year, at higher starting salaries. About 75% of our men will enter military service; all of our graduates available for and seeking employment will be placed. Great demand for married graduates, for women graduates and some demand for physically handicapped.

UNIVERSITY OF NEVADA (College of Engineering) - Employment demand for engineers at least double that of last spring; starting salaries running 25% to 50% higher. From 10% to 15% of our men will enter military service; all remaining graduates will be placed.

MONTANA STATE UNIVERSITY (School of Business Administration) - Employment demand started later this year; starting salaries same to slightly higher. From 40% to 45% of our men will enter military service; present prospects are that all available graduates seeking employment will be placed.

UNIVERSITY OF WYOMING (College of Engineering) - Employment demands about 200% greater this year with starting salaries some 25% higher. About 25% of our men will enter military service; all available graduates seeking employment will be placed this year, with structural steel companies, aircraft companies, in civil service, etc.

UNIVERSITY OF WASHINGTON (College of Engineering) - Five times as many calls as in 1941 with starting salaries showing a 20% increase. About 16% of our men graduates will become junior officers; all available for employment will be placed. Market for women greatly improved - all can get good jobs. Same situation holds in regard to married graduates and in regard to those physically

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handicapped. Local placements being made in aircraft manufacturing, engine manufacturing, electrical concerns, research, civil service, and with Federal agencies.

UNIVERSITY OF WASHINGTON (College of Economics and Business) - Employment calls show 100% increase over last year; starting salaries average 40% to 50% higher. Some 70% of our men will enter military service; all graduates available for employment will be placed, mainly in war industries. Greater demand for women, for married graduates, and for the physically handicapped.

UNIVERSITY OF OREGON (School of Business Administration) - Much heavier employment demand this year with starting salaries 20% better. Probably 50% or more of our men graduates will enter military service; all grads seeking employment will be placed, principally in accounting, office work, mercantile field, and in ship building, aircraft and lumber industries.

OREGON STATE COLLEGE (School of Engineering) - Demand for engineers about five times as great as last year. Starting salaries running 25% to 50% higher. About 35% of our men will enter military service; all available for employment will be placed, principally in the heavy defense industries.

CALIFORNIA INSTITUTE OF TECHNOLOGY (School of Engineering) - Employment demand considerably greater than last year; starting salaries substantially higher. Probably 10% of our men will enter military service; all graduates available for employment will be placed in war industry.

UNIVERSITY OF SOUTHERN CALIFORNIA (School of Engineering) - Employment calls much greater than last year, at higher starting salaries. Probably 25% to 30% of our men will enter military service immediately; all graduates available and able to work will be placed - many have had from two to five offers each. About half will be placed in war industries, the remainder in regular industry.

UNIVERSITY OF SANTA CLARA (College of Business Administration) - Employment demand sharply reduced from last year but starting salaries running higher. Approximately 50% of our men graduates will enter military service. Heavy demand for engineering graduates, at higher salaries than available last year. Definite demand for graduates with dependents.

COLLEGE OF THE PACIFIC (School of Commerce) - Greater number of employment calls than last year with starting salaries higher. About 10% of our men graduates will enter military service immediately; all grads available for employment will be placed. Better chances for women this year, also for married graduates and for physically handicapped.

STANFORD UNIVERSITY (School of Engineering) - Employment calls about double last year; starting salaries approximately 20% higher. About 40% of our graduates now scheduled to enter military service, but their number is increasing daily. Expect all of the remainder to be placed in employment, mainly in electrical, aircraft, shipping, and construction industries.

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Treasury Department · Defense Savings Staff

NEWS MATERIAL

RELEASE NO. 232

July 21, 1942

FOR IMMEDIATE RELEASE

JUL 1942

WASHINGTON, D. C. -- The appointment of Mrs. Joseph F. Robinson of Jackson, Mississippi, as Southern regional advisor of the Women's Division of the Treasury Department's War Savings Staff was announced today as the nation's women War Savings leaders assembled for a two-day conference.

Meeting under the chairmanship of Miss Harriet Elliott, the Associate Field Director in charge of women's War Savings Staff activities, sessions are expected to develop a more extensive program for the participation of women in promoting the sale of War Bonds and Stamps.

In attendance will be Mrs. Eleanor Wilson McAdoo, representing the West Coast; Mrs. Helene Gans, the Eastern director; Mrs. Dorothy B. Atkinson, the Midwest; Mrs. Robinson and Mrs. Henry Morgenthau, Jr., wife of the Secretary of the Treasury.

Announcing the purpose of the conference, Miss Elliott said:

"The Treasury Department desires to increase the opportunities for women to assist in the War Savings program. The need for women to be more active in the total activities becomes evident as the War Savings work is expanded. We shall initiate plans for more intensive work by women. We shall also act as a clearing house between the states. Women's activities which have been successful in one state will be passed on to other states for consideration. Men and women working together can make a complete success of the War Savings program."

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Mrs. Robinson, the newly named Southern regional advisor, will supervise women's War Savings activities in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas and West Virginia.

Her work as chairman of the Women's Division of the Hinds County War Savings Committee in Jackson since its inauguration in May, 1941, attracted national attention. Her committee was responsible for War Bond and Stamp sales totalling $1,962,386.20 sold through booths operated by volunteer workers.

Before her marriage she was a Mississippi school teacher. Her maiden name was Nancy Currie. She has been active in various civic and social enterprises. She is a member of the Board of Directors of the American Red Cross, a member of the Young Women's Christian Association and the Mississippi Children's Home Society, chairman of the Women's Division of the U. S. O. drive in 1941 and chairman of the Women's Division of the Red Cross War Relief Fund. She is also membership chairman of the Jackson Little Theatre and a member of the Steering Committee for the Office of Civilian Defense.

Mississippi's War Savings Administrator Eugene Fly, in a message to Miss Elliott, congratulated Mrs. Robinson on her new appointment. He said, "The success we have achieved in the City of Jackson and in Hinds County has been due in large measure to Mrs. Robinson's enthusiasm and untiring efforts."

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Chemistry

December 30, 1942

Miss Frances Ann Delaplaine
330 Lindbergh Avenue
Frederick, Maryland.

My dear Miss Delaplaine:

Your letter of December 19th was received just before the holiday weekend.

I do not believe we have anything here to contribute to your detailed report on women's place in "chemistry in industry", as our work does not include surveys on such topics as this. We are aware, from information reaching us from conferences and visitors coming to see us, of the greatly increased need for women in industrial chemistry. The following paragraph might be useful, and it was given us by a representative of the Standard Oil Co. of New Jersey:

"The director of one of our own Esso laboratories, grins over his far-sightedness and courage to brave tradition and scorn, and bring 18 new girls into our laboratory for high test octave gas this January; for, as he remarked, a professional colleague in another concern had scoffed at him then, "No women for me!" "Now he has to take them, if he can find them." And he adds with a chuckle, "But I have the best ones."

In our own Esso laboratory, girls are testing the synthetic rubber samples, that come from the baking sheets in the laboratories, to see if the vast amount of work, money, and brains that have gone into the research of synthetic rubber, have finally attained the best products with which to tread our tires.

In the post-war period, the director of the high octave gas laboratory, referred to above, said if these girls continued to work as well as they had, we shall no doubt keep them. Another director of our laboratories said that they are doing excellent work; that is what is wanted, and we don't expect to throw them out. Mr. Keppel, now one of our regional managers and president of the Standard Oil of Pennsylvania, who during the last war initiated much of the redesigning of jobs for women in factories at that time, said he was sure that women would remain in their new fields."

If you have not had the account of the conference held last spring in Washington by the Institute of Women's Professional Relations, you will be interested in it. It is slightly out of date, but useful to show the keen interest by industry then in recruiting women who had had certain courses in chemistry in college, - and the need is even greater today. I believe it safe to say that the leading chemical companies are

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employing women technicians - Monsanto, Dow, Standard Oil, General Foods, Dupont, etc. Probably the "Chemical & Engineering News" will offer more information for you on its employment page.

The U. S. Office of Education, through its vocational education division, issued a vocational pamphlet on chemistry and chemical engineering, which might prove useful. If you have not examined late issues of Vocational Trends, published by Science Research Associates (1700 Prairie Avenue, Chicago, Ill.), you may find some information there. You probably know also that "Independent Woman" carried an article in its June 1940 issue on women chemists (if you wish to have past history), and the Western Personnel Service, Pasadena, Calif., issued a rather comprehensive pamphlet in 1941 "You Might Like Chemistry as a Career", in which (if I remember correctly) women of importance in this field are named.

I hope these suggestions are useful, and if you have an extra copy of your report we should be glad to have one.

Sincerely yours,

Mary Anderson, Director

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TEACHER SHORTAGE STIRS EDUCATORS

American Council at Chicago Is Told It May Force Closing of Half of Rural Schools

MANY URGE FEDERAL AID

Negro-Teaching Is Under Fire, Race Bias Charge Provokes Naval Lieutenant to Reply

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By BENJAMIN FINE

Special to THE NEW YORK TIMES.

CHICAGO, May 1—A serious shortage of teachers faces this country, which may result in the closing of 50 per cent of the rural elementary schools as well as many public schools in large cities, prominent educators warned at the opening of the twenty-fifth annual conference of the American Council on Education.

It was brought out that many teachers were leaving their positions to get higher salaries in defense industries. This trend was deplored by the educators, who felt that it would inevitably mean a lowering of teaching standards, and an influx into the educational profession of men and women without adequate qualifications.

The most pessimistic prediction came from Dr. Floyd W. Reeves, director of the American Youth Commission, who said that many schools in rural areas had already closed, primarily because teachers were not available. It was he who said that by the end of 1943 half of them might be closed. City schools would, Dr. Reeves asserted, but to maintain educational services at their peace time level of quality, he added, it would be necessary to provide Federal law.

A similar situation will exist on the higher education level, unless Federal funds are provided, Dr. George F. Zook, president of the council, declared in his annual report.

Federal Program Considered

Taking cognizance of this suggestion, Dr. John W. Studebaker, United States Commissioner of Education, told the conference that his office recognized the financial stress under which institutions were now passing as a result of the war and the accelerated program, and said.

"Steps are being taken through appropriate channels to provide for these needs.

Although the commissioner did not mention any specific amount

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"Steps are being taken through appropriate channels to provide for these needs.

Although the commissioner did not mention any specific amount, it was learned from other sources that a plan, sponsored by the Education Wartime Commission, had been presented to the budget director. It was said to provide a sum estimated at $50,000,000 for Federal aid to students and colleges hit by the accelerated program.

Asserting that the impending shortage of teachers had "terrifying" implications, Dr. Karl W. Bigelow, director of the Commission on Teacher Education, asserted that now, as never before, maintenance of the public schools and the existing teaching standards was a matter "of supreme social moment."

Negro Education Criticized

An indictment of the educational program offered to Negroes, particularly in the Southern States, was made by Dr. Mordecai W. Johnson, president of Howard University. He cited figures showing, he said, that while the average per capital expenditures for education in the country was $75 yearly, for Negroes in the South it was only $20 and in five Southern States, $7.60.

Dr. Johnson also declared that the morale of the Negro race at present was "tragically low" as a result of discrimination in the Army, Navy and air forces. The Navy, he said, "is perfectly in accord with Hitler's conception of race and will not have Negroes around except in menial positions."

On the platform were representatives of the Army and Navy, also scheduled to address the educators, and Lieutenant William Exton Jr. of the Navy, who immediately followed Dr. Johnson, departed from his prepared speech and asserted that as an American citizen, when he heard the Navy attacked by name he had "no recourse but to reply."

Saying that the Navy consisted of hundreds of thousands of young men who stood ready to give their lives for this country, Lieutenant Exton said he was "sure that Dr. Johnson did not intend to include them in his criticism."

"I, being an officer, know that we have nothing in mind except winning the war and maintaining the Navy at its maximum efficiency. All decisions are made on that basis only," he added.

In his prepared address Lieutenant Exton upbraided the colleges and universities for sending out students with little or no knowledge of mathematics. The training program of the Navy has been handicapped, he said.

Details of the War Department's enlisted reserve corps were outlined by Colonel Zim E. Lawhon, coordinator of military personnel. College students will be enlisted in this service and their call to active duty deferred until after graduation.

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Women's Bureau
U. S. Department of Labor
Washington

WAR WORK FOR WOMEN IN MAY 1942

by
Bertha M. Nienburg, Chief Economist
Women's Bureau, Department of Labor, Washington

The war program is speeding ahead, and is calling on women as well as men for service. As it moves forward new demands are created and old ones cease to exist; change is the order of the day. A shift from a peace to an all-out-war program cannot be made without dislocations. At this time there is still much confusion concerning the employment of women. Such employment is increasing rapidly in certain occupations and in specific localities. Some labor shortages already have developed. At the same time unemployment--serious in certain localities--is occurring in consumer-goods industries and services.

On April 18 of the present year the President established the War Manpower Commission, with authority to "prescribe basic policies governing the filling of the Federal Government's requirements for man-power...and to issue such operating directives as may be necessary thereto." Paul V. McNutt, Federal Security Administrator, was named chairman, and Arthur J. Altmeyer has been made executive secretary. Federal agencies having to do with employment, placement, and training are under the jurisdiction of this Manpower Commission. Unquestionably, as the commission gets under way the various phases of the use of women in the war effort will be clarified.

Professional, Administrative, and Executive Positions.

As always, the numbers of persons required in professional, administrative and executive positions, even though vital to the war effort, are small in comparison to the numbers needed as skilled, semiskilled, and unskilled workers. As always, men executives call for men for the positions requiring

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experience. Even with the known shortage of persons experienced in the physical sciences, few requests for women at salaries above $2,000 reach the Civil Service Commission. Few requests reach it for women administrators, though there is obvious need for better administration in many points. This is not to say that a woman with specific experience, as a physicist or chemist or engineer, would not be employed in the higher brackets if her experience were brought directly to the attention of executives requiring such experienced personnel. Rather it means that the machinery for full use of the available experienced woman power in the higher-bracket occupations is not functioning smoothly as yet. As a consequence, the demand for women in the higher occupations can be ascertained only by calling on officials in many Government and private organizations. ~~However,~~ Statements that officials make today may be changed by tomorrow, through a change in fundamental hiring policy.

Sporadically, the Women's Bureau has secured information concerning employment needs. Though still very sketchy, such information indicates the trend of demand. A few examples follow:

The Navy Department (Bureau of Ordnance) reports that it can use 12 physicists immediately. The Cancer Institute, the Bureau of Standards, and the Department of Agriculture are interested in women physicists and chemists. Private manufacturers are asking colleges for women mathematicians as well as physicists. It would appear that any woman with experience in physics, electronics, engineering, or mathematics could be placed in war industries.

At the present moment there appears to be a shortage of some types of social workers. The numbers of positions created as a result of the National war program are largest in the Office of Defense Health and Welfare Services, in the United Service Organizations, and in the American

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National Red Cross. Positions in the organizations first and second named deal primarily with the development of recreational resources in areas surrounding Army and Navy bases and rural industrial communities, and in connection with protection from commercialized prostitution in such areas. The Red Cross social worker is concerned with the relief of families of Army and Navy men.

While men are preferred in the field of recreation for men and women are preferred in the field of recreation for women, in hospitals women are chosen to supervise recreation for both men and women, as they are for social case work and occupational therapy. However, there is no central source of information that can provide an exact statement of the number of existing positions to be filled.

With the expansion of the armed forces comes a heavy increase in the use of women in the Army Nurse Corps. As of December 1, 1941, the subcommittee on nursing of the Defense Health and Welfare Services estimated that roughly 10,000 additional nurses would be needed for each of the three following groups: The Army and Navy, the Public Health Service, and civilian institutions. Since this estimate was made, it is probable that the outbreak of war will have greatly increased the numbers required by the Army and Navy. As it is impossible to secure this number of nurses in a short time, auxiliary nursing services are being developed to take over the minor nursing services as nurses' aides.

Women psychologists are finding some employment in the Government, but current reports indicate that more are being employed to replace men leaving the colleges and clinics for war duty. The Army and the Navy Medical Centers are calling for a larger number of laboratory technicians, dental hygienists, pharmacologists, and staff dietitians.

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However, either the Army or the Navy may call on women to undertake any of the professional welfare, clerical, mechanical, or domestic positions now held by enlisted personnel.

Subprofessional Positions

Demand for women in subprofessional positions is more specific than for women in professional positions. Most interesting is the work of the junior engineering aid in the Signal Corps. On completion of the necessary courses, the aid is sent into the field to inspect radio, wire and cable, and wire communications required by the Signal Corps. This inspection calls for many difficult and intricate tests. She must detect any defective piece of equipment, and as perfect equipment on the field of battle is vital to the outcome of a military campaign, hers is an extremely important job. It is a traveling job, as she moves from plant to plant where this type of equipment is manufactured. The beginning salary is $1440 a year.

As all products contracted for by the Government are subject to inspection, there are a number of other inspection jobs available to women today. Such positions, in the main, call for checking many parts with gages and other instruments in the Government arsenals or in the plants manufacturing for the Government. These inspectors usually are paid $1260 a year.

As blue prints are necessary for every part going into the manufacture of a gun, an airplane, or other type of equipment, draftsmen have been needed in large numbers in both Government and private plants. The apprenticeship draftsman in the Federal Government does mechanical and fre-hand drawing, tracing, lettering, and related duties. She begins at $1080 with promotion to junior draftsman at $1,440.

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Mechanical Positions.

The largest numbers of women are wanted in mechanical jobs. In the Federal Government some mechanics learners are given a base salary of $1,020 a year, with possibilities of advancement to $1,440. In other establishments they may be paid by the hour or by the day. Where hourly or daily rates are paid, there usually is opportunity for advancement with experience. In aircraft plants on the Pacific coast the usual beginning rate is 60 cents an hour, with advancement to 75 cents after a short time. Increases depend on the type of job.

An examination of the rates paid for factory employment in the new war-time factories and the rates paid clerical workers in such factories indicates little difference in average rates. For the most part the factory worker has more opportunity of increasing her pay, though her total earnings may suffer if employment is irregular. This situation is true also in the Government service, where the mass of clerical workers are coming in at $1,440, or the same rate paid to junior inspectors and apprenticeship draftsmen.

Farming.

As far as is ascertainable, the need for women in farming is still indefinite and must be localized. While there are requests from dairy farmers in New England for women, the major shortage is expected in harvesting and in canning the fruit and vegetable crops in specific areas. Experience in the First World War revealed that farm work involved so much physical endurance that it was beyond the strength of women not accustomed to it. Efforts to bring the homemaker from the city into the rural areas for harvesting or canning crops are fraught with difficulty. For these reasons the Women's Bureau is urging that every effort be made to have

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such work done by local people who can live at home while engaged in farm work. Should it prove necessary in any community to bring in outsiders, it would seem advisable to call on high-school or college students of 16 years and up and to organize a type of camping arrangement for their housing. In the Province of Ontario such arrangements were made by the Government with the Y.W.C.A. The rates to be paid the boys and girls by the farmers were fixed by the Government, which also paid the Y.W.C.A. for its services in erecting camps, providing food, and supervising the children. This may be a service that the teachers on the Pacific coast and in other hard-pressed areas can render in their communities. However, the recruiting and care of the students must be organized under a responsible agency so that all necessaries are provided before they are brought away from their home environment.

Women's Army Auxiliary Corps and Women's Auxiliary Reserve in the Navy.

Bills to create a Women's Army Auxiliary Corps and a Women's Auxiliary Reserve in the Navy may pass the Senate any day as they have been favorably acted on by the House of Representatives and have been referred to the Senate Committees. Under these bills women may volunteer for noncombatant service with the Army or Navy under the same conditions as men. Positions now held by enlisted personnel, and other positions for which no funds are available for women's employment under Civil Service, will be filled from the ranks of volunteers. The Army Air Corps is most interested in women's employment. It needs women employees to man the radio location centers, and to take over the clerical and much of the other work around air depots.

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12/27/42

Notes for Miss Nienburg's use in speech to be given at Randolph-Macon College

Randolph-Macon College has an enrollment of over 650 girls, coming, in general, from better-than-middle-class families, affluent perhaps (in any case, not poor, such as is known in the Middle West universities). Only an A.B. degree is given. No engineering department. No home economics. Chemistry and physics is offered, as well as biology, history, economics, English, languages, etc.

JOB OPPORTUNITIES FOR GIRLS FROM LIBERAL-ARTS COLLEGE

Government service - "white-collar"

General opportunities never better in office work. Government never grows smaller. Bulk of jobs for women routed through Civil Service.

Junior Professional Assistant. Good spot for those who have studied public administration, economics, statistics, or math through calculus. $2,000. No exam open now; watch for announcement.

Typists and stenographers. Beginners, $1440. Clerk. Statistical clerk

Translating. 15 languages to choose from; knowledge of idiom valuable. Must be able to translate both into and from languages chosen. Speaking ability also tested. Legal residence in country for a year before March 1942 required. Special aptitude test given. Chance at foreign service possible. $1800 to $2300.

Radio. If you know International Morse code, are a citizen, and physically fit for arduous work. Must transmit and receive plain text in code at rate of 15 words; given 8 months to boost speed to 25. All operators are placed with Federal agencies. $1620-$1800. (See below for CAA and civilian airport jobs)

Technical and scientific jobs. Optional branches: radio, explosives, chemistry, physics. For junior-chemists, college degree with 30 hrs. chemistry. $1440-$2000.

Cryptographers. Code and cipher work by Air Transport Command, for active duty with Signal Corps. Plane movements and weather conditions world over. May be absorbed into WAAC. Two years or more of college, alert mind, quick muscular responses, character staunch enough for FBI scrutiny; no emotional weaklings need apply. Must be able to keep secrets, deal intelligently with military information, accept assignments anywhere at any time. Will train on the job. $1620; code and cipher rooms open 24 hours, 8-hour shifts, Sunday work usual. Serve in units; some already at "undisclosed" places

Artist-designer. Make pictorial maps, charts, posters, etc. 2 yrs. college. $1620-$2600.

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Notes for Randolph-Macon speech

Government service - Cont'd

Representatives of the Federal Bureau of Investigation have been in various cities to interview women applicants; they expect to enroll about 2000 to 3000 women clerical workers throughout the country. Women hired as fingerprint classifiers will receive $1440; stenographers $1620; and laboratory workers $2000.

Meteorologists, junior grade - U.S. Weather Bureau is definitely recruiting girls for training . Observational work, recording, calculating, and perhaps predicting weather conditions. Intricate and extremely detailed work.

WAFs- Women's Auxiliary Ferrying
Of 50 to be recruited for initial unit, about 40 will be active pilots and the others assigned to administrative duties. All must have not less than 500 hours logged and certified flying time.

WAACs-

WAVES-

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Notes for Randlph-Macon speech

Airports

Air Traffic Control. (Clearance of planes from one Civil Aeronautics zone to another). Directs landings and take-offs. Under immediate supervision and instruction, performs simple routine assignments; appointees will be subject to a period of training for 6 months. Applicants must be high school graduates and, in place of experience required, applicants can substitute college (4 years apparently, but announcement gives no indication of what courses should be included) and minimum age is 20 [may be changed by now]. $1800.

Girls wanted also for clerical and other work in air traffic control centers,

Apply to nearest CAA regional office - LaGuardia field (NY), Atlanta, Chicago, Ft. Worth, Kansas City, Santa Monica (Calif.), Seattle, Anchorage (Alaska).

When popular flying arrives, more women managers of airport fields needed. (Planck "Women With Wings")

Aerial photography. Women can be used in ground work necessary in aerial photography, such as assembling, making contour lines, developing and checking. (Planck "Women With Wings")

Airport jobs for women include reservation supervisor and clerk, passenger service superintendent, passenger agent, dispatch clerk, food experts, (dietitians are made chief hostesses) stewardesses on planes.

(Ground mechanics, servicing the planes, are women in many places)

Radio

Two women, said to be the first women master control room operators in the East, have replaced men engineers after 4 months training. A woman has joined the Houston (Tex.) police department in the radio division.

Aviation:

Bibliography: Planck, C.E., Women With Wings. Harper. 1942.
Meyer, Dickey, Wanted-Women in Aviation. McBridge. 1942.
Hager, Alice Rogers, There's Always A Way Up. In Mademoiselle, Feb. 1941

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Notes for Randolph-Macon speech

Private industry (selected from newspaper clippings)

Banks. More than 55 classifications of jobs in banks are now being offered to women. Proportions of women, leading New York City banks, have risen 30 to 50 percent in the last 9 months.

Railroads. A staff of young college women is being organized and trained by the Pennsylvania Railroad for ticket selling, reservation and information work throughout the system. Several schools have been set up for this purpose, and it is planned to graduate about a dozen girls every 5 or 6 weeks. The number of information and reservation attendnats in Eastern terminals has been trebled during the last year.

The Southern Pacific is hiring women as clerks, telegraph operators, messengers, and teletype operators.

Insurance. Women are now enrolled in training courses given by Phoenix and Aetna companies. Travelers' has not yet admitted women to training.

Laboratories.

Standard Oil of N.J. is using women in the chemical testing laboratory, testing samples of synthetic rubber as they come from the baking sheets in the laboratories. They are trained under the laboratory supervisor right on the job. Other Standard Oil companies are recruiting girls who have had college chemistry. On the West Coast, the eight oil refineries in the San Francisco area are using girls as inspectors of petroleum products, ~~recruited by~~

International Nickel Co., Huntington, W.Va. is recruiting girls for work in its laboratories.

Consolidated Copper Co. and Miami Copper Co., Arizona, are using girls in the laboratories and offices.

A few women chemists are working in the synthetic rubber laboratories in Akron.

General Electric recently hired 150 young women college graduates [presumably physics had]. They will be trained at Schenectady N.Y.

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Notes for Randolph-Macon speech

Chemists, physicists, mathematicians, in general

Chemists -
All degrees of skill needed. Chiefly analytical, some compounding, spot-testing, new-product research, tabulations. $1500 up. Laboratory technicians, $18-$23 a week (mostly highschool graduates only).

Physicists -
Must be trained in research. Needed for aircraft research, computations for ordnance and shipbuilding engineers, gas and projectile research. $1500 up.

Mathematicians -
With one year of college math, can get jobs as engineering aides; majors in math become statisticians, high-priced researchers, testing program, figure work for construction engineers. $1400 up.

Better starting salaries, more jobs than there may ever be in these lines again. A crack in plant and construction work never before open to women. Very few drawbacks. Industrial plants bend over backward to take care of women chemists, etc., but shift systems in research and production jobs mean much night work. Postwar prospects not so hot. Whether true or not, practically all women are hired with the understanding they are filling in for draftee who gets job back as soon as he is demobilized. A few women wizards, with Ph.D.s and research projects leading to profitable patents, will stay on.

Occupational therapists. many needed
short course being given at Columbia
etc. etc.
Physiotherapists, many needed.
2 yrs of college, esp. phys. educ. major
(See Readers Digest for Nov.)

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If further training can be taken -

The government-sponsored program at college level is known as Engineering-Science-Management War Training. Short intensified courses are offered to girls with 2 years of college and to college graduates as well, along various lines. Most common are courses in drafting, inspecting, production supervising, and depending on college background highly technical training in physics, chemistry, and mathematics fields.